



Towards an Operational GMES Land Monitoring Core Service

AGI SDI Server 2011 G2

User Manual – Publishing SATChMo Data

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1 BACKGROUND OF THE DOCUMENT

1.1 EXECUTIVE SUMMARY

The current document describes main procedures and practical steps for establishment of on-line data distribution and portrayal services, as well as creating and publishing metadata records on the G2 SDI portal. Taking G2 SATCHMO datasets as practical example, all the procedures of installing dedicated SDI servers and establishment of SDI services are described.

1.2 SCOPE AND OBJECTIVES

The manual provides practical instructions and guidelines for G2 data providers on establishment of a minimum set of SDI services and populating those with corresponding data files and metadata records. The list of described SDI services includes

- conventional data download services (FTP/HTTP),
- SDI data portrayal services (WMS),
- and SDI metadata catalog services (CSW).

Implementation of all the services is demonstrated on open source GeoServer and Deegree software packages. The report also provides detailed instructions on creation and editing of metadata records with the help of on-line GMES Metadata Editor developed by G2 SDI Team. All the examples and instructions are customized to the G2 SATCHMO datasets and metadata. The current report is part of deliverables produced by G2 SATCHMO and SDI components.

1.3 CONTENT OF THE DOCUMENT

This document consists of these major sections:

- Publishing the datasets as GeoServer WMS layers;
- Creating the metadata records with GMES metadata editor;
- Uploading metadata to CSW server (optional).

There are also 3 annexes with examples of metadata XML document, WMS style sheet document and file naming specifications of SATChMo VHR datasets.

1.4 RELATED DOCUMENTS

1.4.1 Input

Overview of former deliverables acting as inputs to this document.

Document ID	Descriptor
CCC-DDD-NNNN	Practical guidelines for setting up SDI services with datasets and metadata
--	AGI SDI Server User Manual (2010)

1.4.2 Output

Overview of other deliverables for which this document is an input.

Document ID	Descriptor
CCC--DDD-NNNN	

2 PUBLISHING DATA - OVERVIEW

For practical demonstration of data and metadata publishing on the G2 SDI, we will further use an example of SATChMo VHR datasets.

There are minimum four elements of information to be published on-line by SATChMo data providers in order to complete integration of any dataset (processed image) on the G2 SDI after the dataset passes the QC procedure. Three of those elements should be hosted on the internet services established and maintained by the data providers, and the fourth one should be hosted by external SDI service.

SATChMo VHR Land Cover Data classification results should be published as follows:

- Archives (zip) containing actual vector and raster files with classification results should be published for ordinary download on ordinary FTP or HTTP web services hosted by data providers. Those files will be downloaded and directly used by project partners and other clients. There is an abundant market of hosting those internet services by external public or commercial service providers, alternatively – if G2 data providers are willing to establish their own web services – there is a lot of detailed documentation on-line for different operating systems and implementation of internet services. Anyway, we will not focus on this issue in the current report – please consult your System Administrator.
- The same was as with datasets, the data providers must publish so-called quick-looks (preview pictures in GIF, JPEG or PNG formats and reasonable dimensions/file size) of the corresponding datasets on their HTTP servers. This is particularly requested by G2 SDI Portal to complete metadata records on your datasets. So – to stress it again – publishing (at least one, but can be several pictures per one dataset, if necessary) quick-look picture of your datasets is obligatory.
- Image classification results – vector datasets (.shp files) also should be made accessible via WMS server(s) to the web mapping applications. For this purpose, dedicated WMS servers should be established and further maintained by data providers, and vector datasets should be loaded into those WMS services and configured appropriately (definition of color styles, projections, etc.) - as described in further sections of this report.
- Each dataset of image classification results must have its own dataset metadata record, created by data providers using a simple GMES metadata editor – <http://land.eu/gmes-metadata-editor/login/auth>. For the SATChMo component, those dataset metadata records will be hosted by AGI on its CSW server. Dataset metadata records must have common parent identifier code (this will be provided by AGI), defined in “dataset series” metadata. Metadata about a dataset series called “SATChMo VHR Land Cover Data classification results” has been created **once by AGI**, submitted and currently published on Geoland2 portal.

So, to conclude, each data provider should have the following on-line services accessible directly from the internet in the form of static URLs:

- WWW or FTP server to host archived datasets with image classification results AND datasets quicklook images.

- WMS server to host vector datasets with classification results.

Note, that all these servers do not need to have the same IP address – there are separate fields in metadata profile for each of them.

To complete the preparation for publishing their completed and QC'd datasets on the G2 SDI, the data providers should perform the following tasks should on each of their datasets archive:

1. Unpack quicklook image (GIF/JPEG/PNG) from the archive.
2. Upload both archive zip file AND the quicklook image to the web server accessible directly from the internet. It is strongly recommended that the quicklook images are published on HTTP service. You need to record exactly what are the URLs (internet links) pointing to the dataset archives and quicklook images. This information will be essential in completing the metadata records.
3. Unpack the vector dataset from the archive and upload it to your WMS server. Record the URL of your WMS layers presenting SATChMo datasets (see further chapters of the corrent Manual). Access to your WMS services should be also configured on G2 SDI portal.
4. Create metadata XML documents for each of the dataset archives and send it to the data provider responsible for maintaining the CSW server (in case of SATChMo VHR datasets that should be AGI).

3 PUBLISH DATA ON GEOSERVER

Publishing data in GeoServer consists of two steps:

1. Files, containing vector (and raster) data has to be uploaded to the computer, where GeoServer is installed (for example, by using ftp service remotely).
2. After placing the datasets on the server running your WMS, the service is configured and datasets published by using GeoServer's web interface.

GeoServer data management menu has several main components to be configured:



Figure 1: GeoServer Data menu

Here is a quick explanation of GeoServer Data menu components and the required operations to publish your datasets:

Table 1: GeoServer Data menu

Component	Description
Workspaces	Workspace is a container which is used to organize other items. In GeoServer, a workspace is (often) used to group similar layers together. For instance, typical workspace could be called SATChMo to contain G2 SATChMo dataset.
Stores	A store connects to a data source that contains raster or vector datasets. A data source can be a file or group of files such as a table in a database, a single file (such as a shapefile), or a directory. The store construct is used so, that connection parameters are defined once, rather than for each piece of data in a source. As such, it is necessary to register a store before loading any data.
Layers	In Geoserver, the term layer refers to raster or vector data that contains geographic features.
Layer groups	A layer group, is a group of layers that acts as a single layer. This is useful when creating a basemap, or other situations when more than one separate layer needs to be requested simultaneously or frequently. Since layers tend

	to contain only a single type of geometry, this allows to combine data types in one request. A layer group is relevant to WMS (map image) requests only. There is no equivalent to WFS requests.
Styles	Geospatial data has no inherent visualization. Therefore additional information, in the form of a style, needs to be applied to data in order to visualize it. GeoServer uses the Styled Layer Descriptor (SLD) markup language, a subset of XML, to describe geospatial data. See the <i>Styling</i> section in GeoServer user manual for more information on working with styles.

So, to publish your vector datasets on the WMS after you place them physically on the server running WMS service, it is necessary to complete at least those three steps:

1. Create a workspace (call it SATChMo for example);
2. Register a data store for your uploaded dataset(-s);
3. Create a new WMS layer and point to a certain newly uploaded dataset (to be repeated for all new datasets);
4. Create (if not done already) a new style and assign it to your newly created layers.

The procedure will be described in detail in the following sections of the current report.

While publishing large amounts of spatial data on-line, it is essential to follow the standard file naming rules and conventions. In case of G2 SATChMo VHR component, the agreed specifications of file naming are described in detail in Appendix 3 of the current report.

3.1 UPLOAD DATA TO GEOSERVER DATA DIRECTORY

Before publishing data in GeoServer, it should be uploaded into Data Directory first. Again, please make sure that file naming conventions are properly followed. The following example shows how a typical sequence of dataset deployment operations on Ubuntu Linux server may look like this:

1. Create folder SATChMo in \$GEOSERVER_DATA_DIR/data, for example

```
sudo mkdir /sdi/geoserver/data/data/SATChMo
```
2. In SATChMo folder, create a subfolder shp for vector data. For example:

```
cd /sdi/geoserver/data/data/SATChMo
sudo mkdir shp
```
3. Copy your vector data to shp folder. For example, for UK_20090912_3970_K_v1.zip (unpack archive before copying):

```
sudo cp V_UK_20090912_3970_K_v1.*
/sdi/geoserver/data/data/SATChMo/shp
```
4. Change SATChMo directory permissions:

```
sudo chown -R tomcat6:tomcat6 /sdi/geoserver/data/data/SATChMo
```

Where is current GeoServer data directory, can be found in variable `$GEOSERVER_DATA_DIR` at `WEB-INF/web.xml` file for the GeoServer application (in our case, it is located at `/var/lib/tomcat6/webapps/geoserver/WEB-INF/web.xml`), or using web interface:

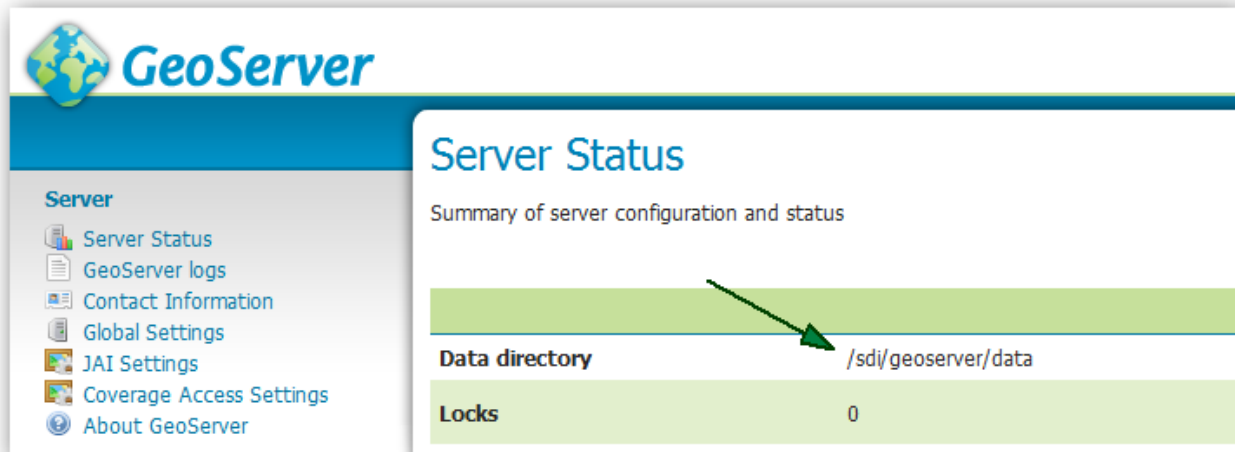


Figure 2: Geoserver Data directory

3.2 CREATE A WORKSPACE

The first step in data loading is creation of a workspace (unless you already have created one earlier). This creates a certain container for your datasets related methodologically or thematically under one project. Creating a workspace is also essential, because it will allow to distinguish between different groups of WMS layers published on the same WMS server.

As for G2, you will have to provide a link to a certain workspace on your WMS server which contains SATChMo VHR datasets in order to publish them on the G2 Portal.

To create a GeoServer workspace, you will need to follow these steps:

1. Navigate to the main GeoServer Web Administration page (<http://localhost:8080/geoserver>, replace `localhost` with your GeoServer address).
2. Click on the Workspaces link on the left column, under Data.
3. Click on the “Add new workspace” link at the top centre of the page.

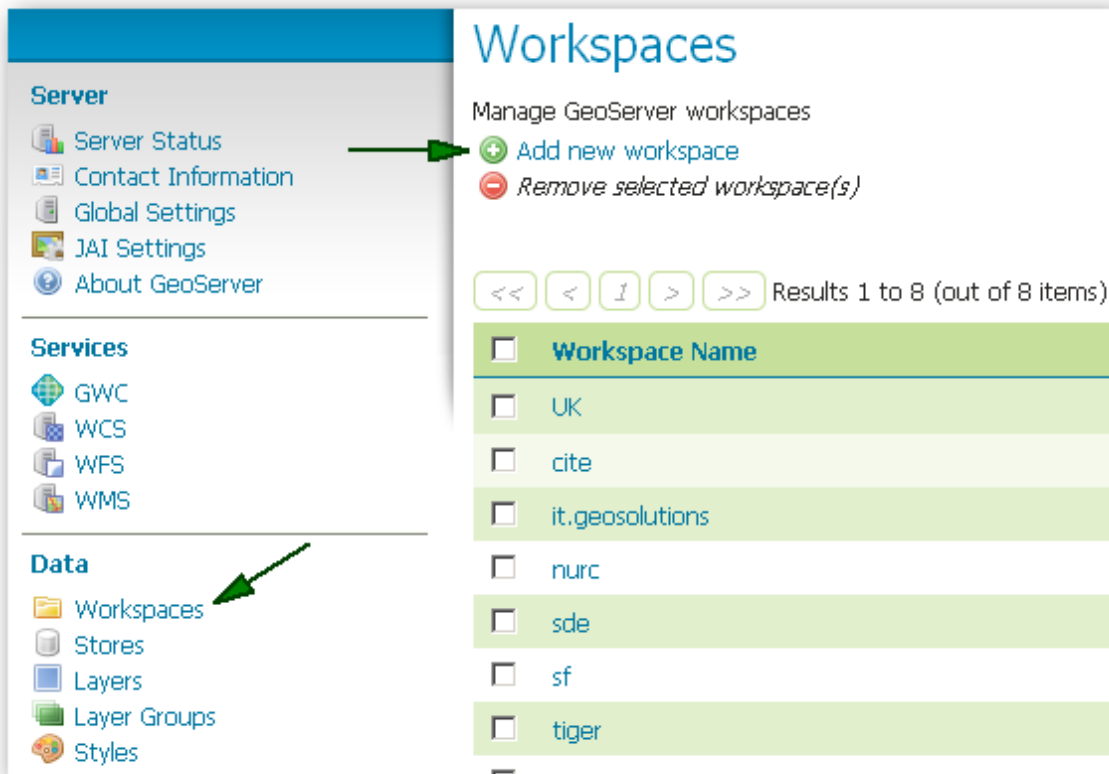


Figure 3: Create new workspace

In the next page, you will be prompted to enter the workspace name and URI.

Table 2: New workspace properties

Field	Value
Name	SATChMo
Namespace URI	http://www.geoland2.eu
Default workspace	Yes (select checkbox)

Note: you can add data to non-default workspace, too.

4. Click on “Submit” to add new workspace into your WMS server.

3.3 ADD A STYLE FOR VECTOR DATA

Before uploading vector data (shape files), their visualization style must be defined, because with WMS client it is not possible to change style of datasets in client application. In other words, if a certain style is not assigned to a vector dataset published by your WMS server, on all the “clients” (desktop GIS or on-line mapping applications) it will all appear single-coloured, and the clients will NOT be able to change the thematic colouring, making your WMS service practically useless for any thematic mapping purposes. Another important aspect of styling WMS datasets is that they

must be defined the same way in all the WMS services hosted by separate data providers in order to maintain thematic integrity in large-scale (regional) thematic mapping applications.

In order to set up the style(-s) of your datasets published over WMS services, you need to complete the following steps:

1. Navigate to the main GeoServer Web Administration page.
2. Click on the Styles link on the left column, under Data.
3. Click on the “Add new style” link at the top centre of the page.
4. Click on “Validate” to check new style, then, if no errors are found, on “Submit” to add new style.

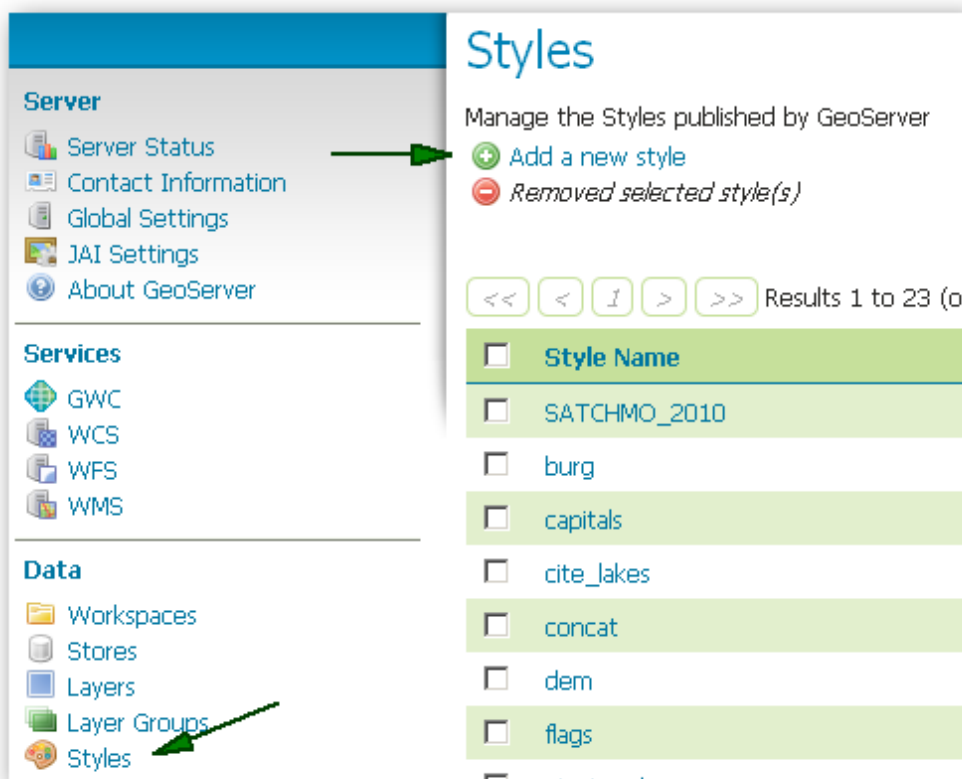


Figure 4: Create new style

In next page, you will be prompted to enter the style name. Style itself can be typed (or copy/pasted) in editor or uploaded as file. See [Appendix 2](#) for complete style.

Table 3: New style properties

Field	Value
Name	G2_SATChMo
Editor or SLD file	Copy/paste XML data from Appendix 1 into editor in “New style” page or save it as SATCHMO_2010.sld and upload it by clicking “Browse”, selecting this file, clicking on “Upload...”.

See GeoServer documentation for detailed information about style creation:

<http://docs.geoserver.org/stable/en/user/styling/index.html>

3.4 UPLOAD DATA TO GEOSERVER DATA DIRECTORY

Before publishing data in GeoServer, it should be uploaded into Data Directory first. Again, please make sure that file naming conventions are properly followed. The following example shows how a typical sequence of dataset deployment operations on Ubuntu Linux server may look like this:

5. Create folder `SATChMo` in `$GEOSERVER_DATA_DIR/data`, for example

```
sudo mkdir /sdi/geoserver/data/data/SATChMo
```
6. In `SATChMo` folder, create a subfolder `shp` for vector data. For example:

```
cd /sdi/geoserver/data/data/SATChMo
sudo mkdir shp
```
7. Copy your vector data to `shp` folder. For example, for `UK_20090912_3970_K_v1.zip` (unpack archive before copying):

```
sudo cp V_UK_20090912_3970_K_v1.*
/sdi/geoserver/data/data/SATChMo/shp
```
8. Change `SATChMo` directory permissions:

```
sudo chown -R tomcat6:tomcat6 /sdi/geoserver/data/data/SATChMo
```

3.5 PUBLISH VECTOR DATASETS IN GEOSERVER

The overall procedure of datasets publishing on GeoServer WMS is rather straightforward. At first, you need to create new store to define a connection to the directory (on your server) containing your vector datasets. When data store is defined, you can start publishing individual datasets. The following chapters will illustrate the whole process in detail.

3.5.1 Create new vector data source

Defining the new data source on GeoServer is done by the following procedure:

1. Navigate to the main GeoServer Web Administration page.
2. Click on the Stores link on the left column, under Data.
3. Click on the “Add new store” link at the top centre of the page.
4. In “New data source” window, select “Directory of spatial files”

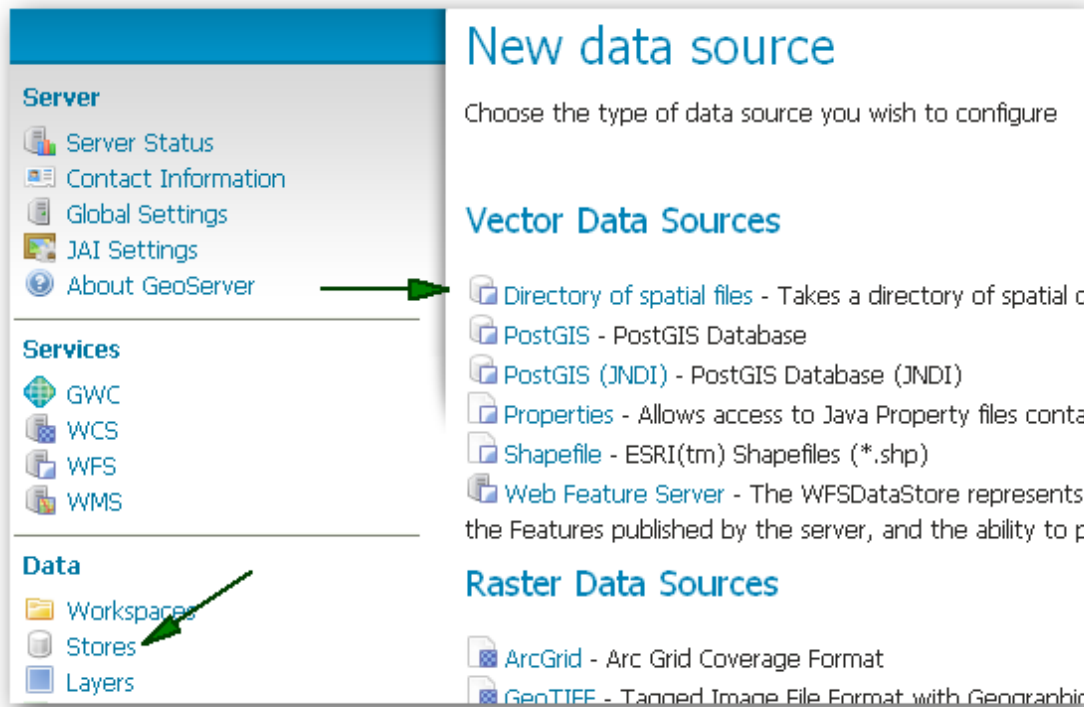


Figure 5: Adding new vector data source

5. In next page, enter following:

Table 4: New Vector Data Source properties

Field	Value
Workspace	SATChMo
Data Source Name	shp
Description	
Enabled	Yes (tick checkbox)
URL	file:data/SATChMo/shp

6. Click „Save“. If there is already files in data source folder, list of detected layers will be shown (you can ignore it now – layers will be published in next step).

3.5.2 Publish vector layers

To publish vector datasets recently added to Vector Data Source, you need to complete the following steps:

1. Navigate to the main GeoServer Web Administration page.

2. Click on the Layers link on the left column, under Data.
3. Click on the “Add a new resource” link at the top centre of the page.
4. In next page, from drop-down menu choose appropriate Workspace:Store (for example: SATChMo:shp)

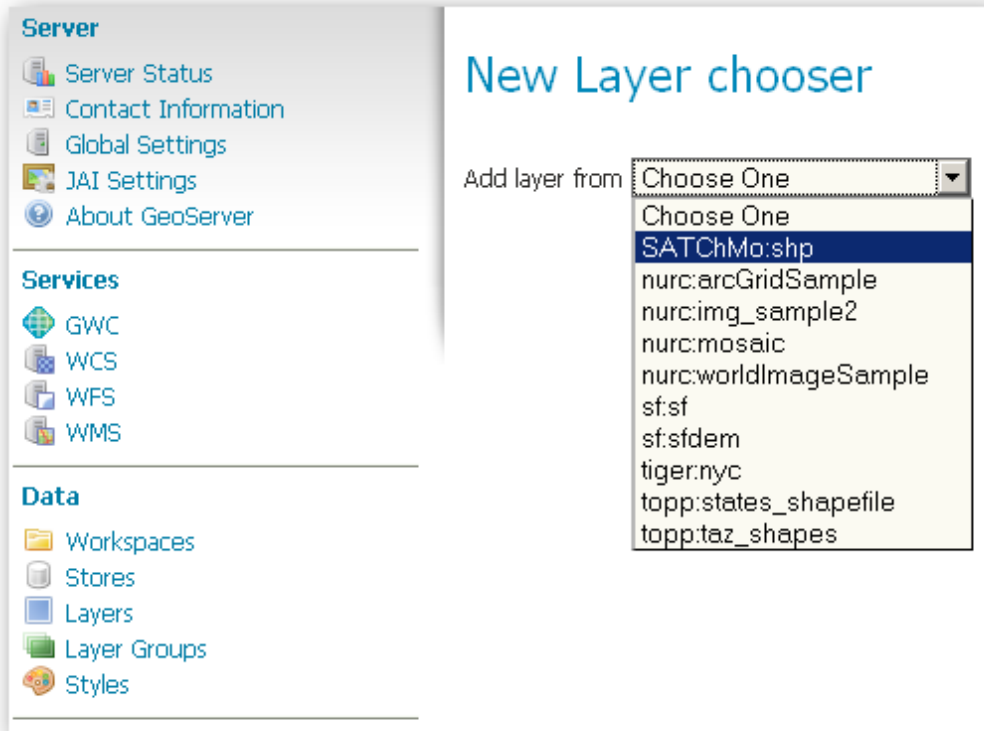


Figure 6: Choosing new layer

5. Detected in chosen store layers will be shown – both published and unpublished.

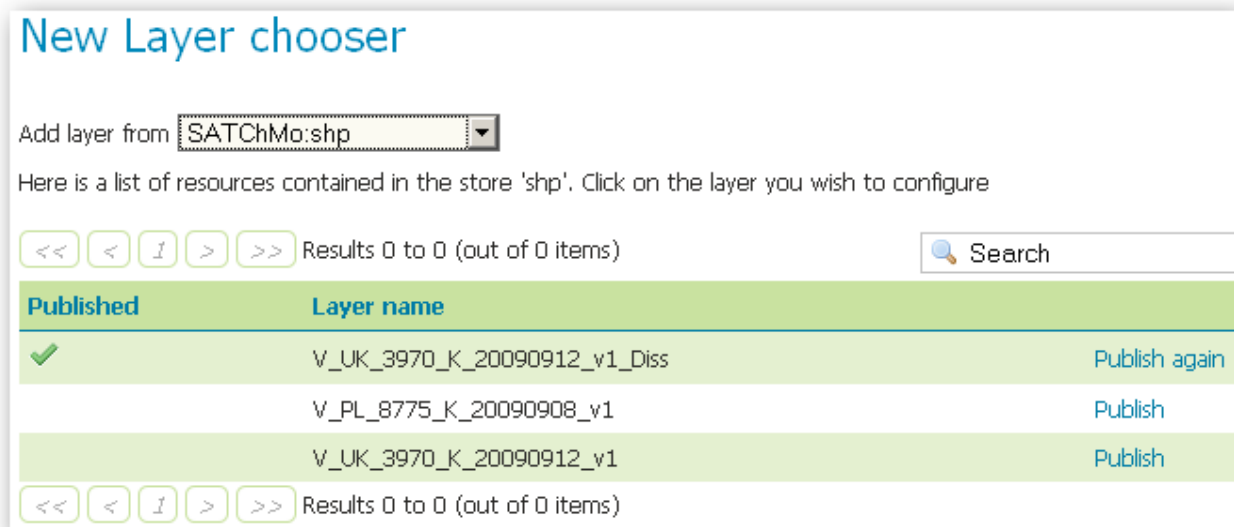


Figure 7: Detected layers in store

6. Select layer you want to publish, click on “Publish” next to that layer's name.
7. In next page, enter some metadata about layer (follow the screen-shots):

SATChMo:V_UK_3970_K_20090912_v1

Configure the resource and publishing information for the current layer

Data

Publishing

Basic Resource Info

Name

Title

Abstract

Keywords

Current Keywords

Remove selected

New Keyword

Add

Metadata links

No metadata links so far

Add link

Figure 8: Configure the resource information for the current layer (part 1)

It would be very useful if you could provide an abstract and at least some other information for each of your datasets published as WMS layers. In fact, this is the only way the clients will be able get any metadata information on your WMS broadcasts, as there will be NO DIRECT LINK between WMS layers published on your server and metadata records on the downloadable dataset files published on the G2 Portal Web Catalog Service.

Table 5: Configure the resource information for the current layer (part 1)

Field	Value
Name	(leave default)
Title	(leave default)
Abstract	(abstract is highly recommended)
New Keyword	(keywords, if any)
Metadata links	(metadata links, if any)

Continue on the same page. Next part is coordinate reference systems properties. If native SRS is not detected, enter it manually, then calculate bounding boxes (by clicking on link “Calculate ...”).

Coordinate Reference Systems

Native SRS
 [WGS_1984_UTM_Zone_30N...](#)

Declared SRS
 ...

SRS handling
 ▼

Bounding Boxes

Native Bounding Box

Min X	Min Y	Max X	Max Y
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

[Compute from data](#)

Lat/Lon Bounding Box

Min X	Min Y	Max X	Max Y
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

[Compute from native bounds](#)

Feature Type Details

Property	Type	Nullable	Min/Max Occurrences
the_geom	MultiPolygon	true	0/1
AREA_ha	Double	true	0/1
Class_name	String	true	0/1
NDVI	Double	true	0/1

[Reload feature type](#) ...

Figure 9: Configure the resource information for the current layer (part 2)

Table 6: Configure the resource information for the current layer (part 2)

Field	Value
Native SRS	(if not detected – enter in “Declared SRS” field below)
Declared SRS	Enter corresponding coordinate system in EPSG format (for example: EPSG:32630)

SRS handling	Force declared (if native SRS is undetected, otherwise – leave default)
Native Bounding Box	If native SRS is undetected, enter it in “Declared SRS” field, then press “Compute from data” link. Otherwise it will be calculated automatically.
Lat/Lon Bounding Box	If native SRS is undetected, enter it in “Declared SRS” field, then press “Compute from native bounds” link. Otherwise it will be calculated automatically.

DO NOT press “Save” yet – you need to configure publishing information as well!

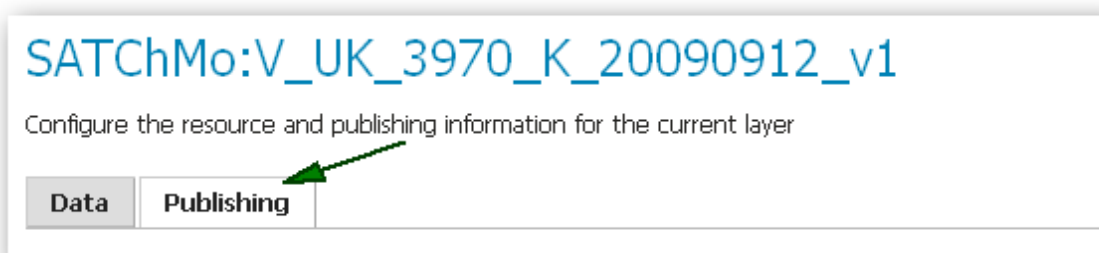


Figure 10: Proceed to publishing information

In the Publishing tab you will have to enter layer's publishing properties.

SATChMo:V_UK_3970_K_20090912_v1

Configure the resource and publishing information for the current layer

Data
Publishing

Basic Settings

Name

Enabled

HTTP Settings

Response Cache Headers

Cache Time (seconds)

WFS Settings

Per-Request Feature Limit

Maximum number of decimals

Figure 11: Configure the publishing information for the current layer (part 1)

Table 7: Configure the publishing information for the current layer (part 1)

Field	Value
Name	(leave default)
Enabled	Yes (tick checkbox)
Response Cache Headers	(leave default)
Cache Time (seconds)	(leave default)
Per-Request Feature limit	(leave default)
Maximum number of decimals	(leave default)



Figure 12: Configure the publishing information for the current layer (part 2)

Table 8: Configure the publishing information for the current layer (part 2)

Field	Value
Default style	G2_SATChMo
Additional styles	(none)
Default WMS Path	(leave default)

WMS Attribution

Attribution Text

Attribution Link

Logo URL

Logo Content Type

Logo Image Width

Logo Image Height

[Auto-detect image size and type](#)

KML Format Settings

Default Regionating Attribute

Default Regionating Method

Features Per Regionated Tile

Figure 13: Configure the publishing information for the current layer (part 3)

Table 9: Configure the publishing information for the current layer (part 3)

Field	Value
Attribution text	(leave default)
Attribution link	(leave default)
Logo URL	(leave default)
Logo Content Type	(leave default)
Logo Image Width	(leave default)
Logo Image Height	(leave default)

Default Regionating Attribute	(leave default)
Default Regionating Method	(leave default)
Features Per Regionated Tile	(leave default)

8. Press “Save”. Congratulations, new WMS layer is published! The web clients will be able to “see” your layers immediately.

3.6 CREATE THE LAYERS GROUP

After layers are published, they should be assigned to layer group. This step otherwise is not obligatory, but on the G2 Portal there is a so-called “SATChMo VHR Land Cover Dataset Catalogue”, which is configured to access a layer group, not separate layers – so for SATChMo datasets published on your WMS server creation of a layer group is obligatory. Later, you can add/update layers in that group without reconfiguring Geoland2 catalog.

The procedure is simple: you must select “Data – Layer” groups in left menu, then select “Add new layer group”.

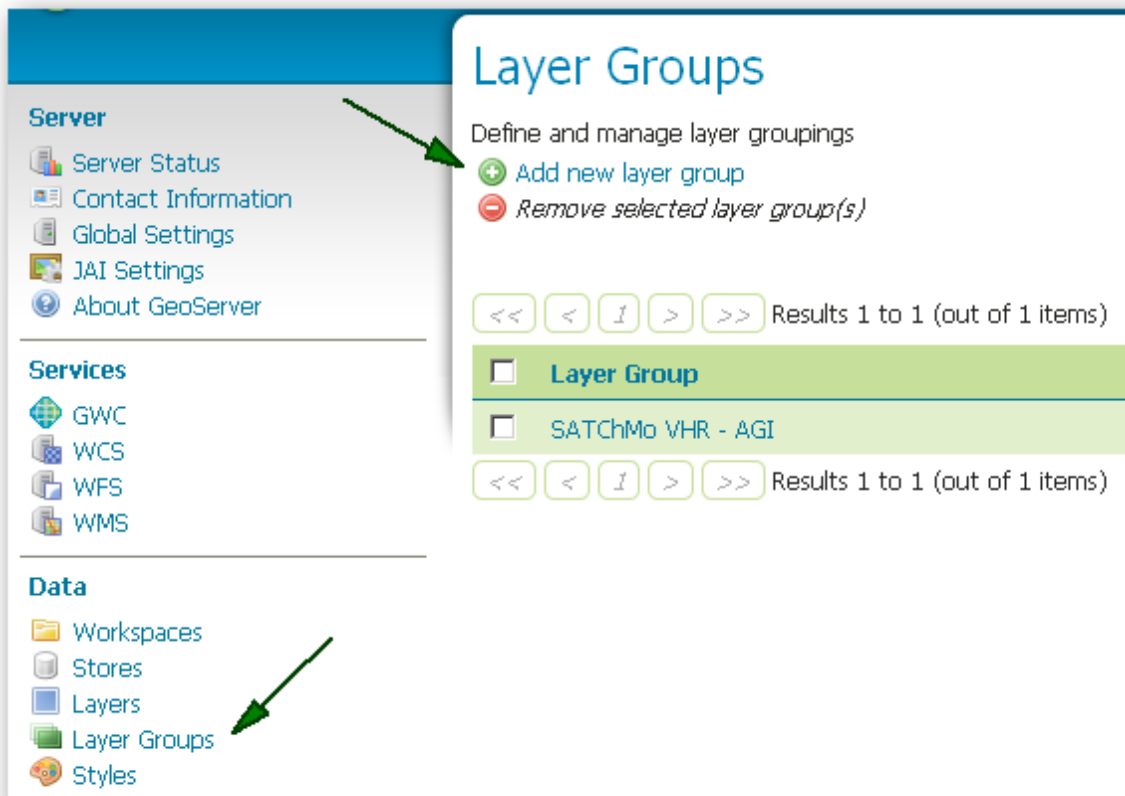


Figure 14: Add new layer group

In next page, enter layer group name, coordinate system (EPSG:4326), then add layers. After that, press “Generate Bounds” button.

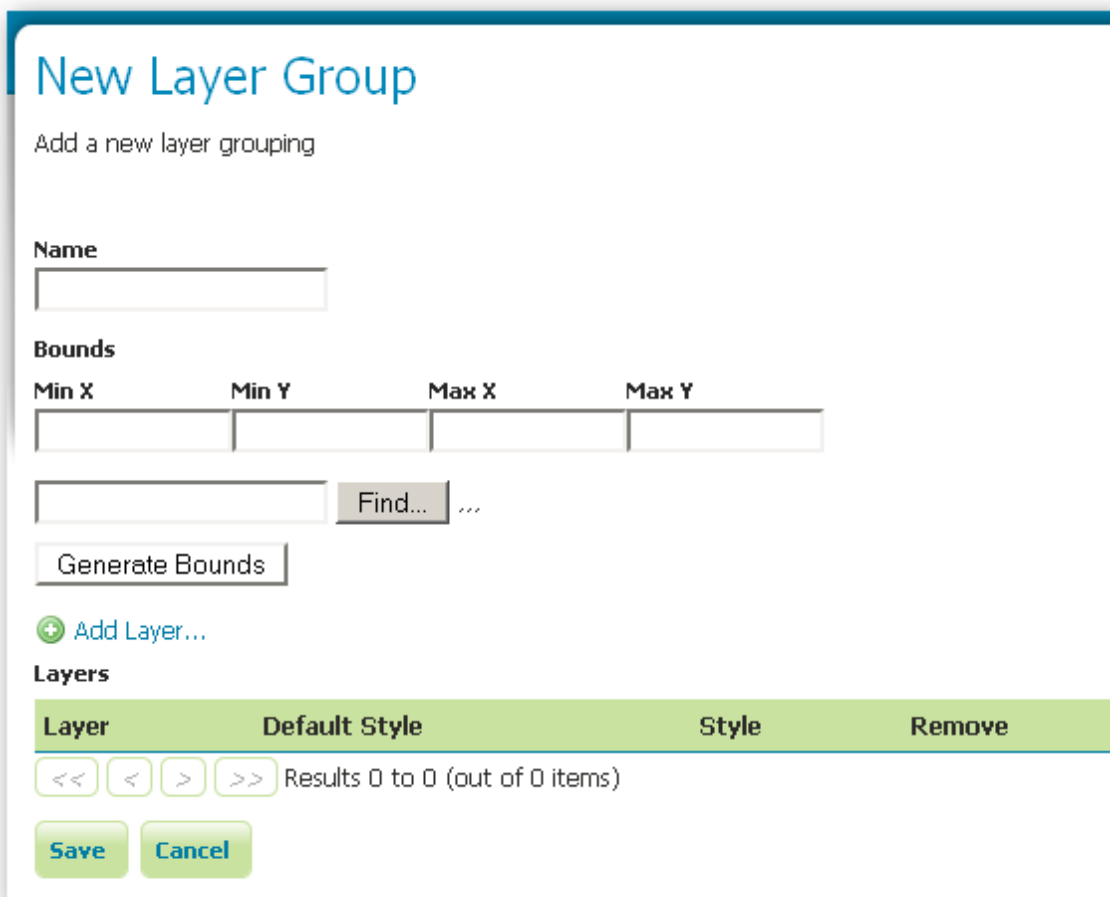


Figure 15: New layer group properties

Table 10: New layer group properties

Field	Value
Name	SATChMo VHR – [data provider]
Bounds	(Press “Generate bounds” after adding layers)
(coordinate system)	EPSG:4326

Finally, select “Add layer” link (below “Generate bounds” button). In pop-up window, select layer, you want to add to the group:

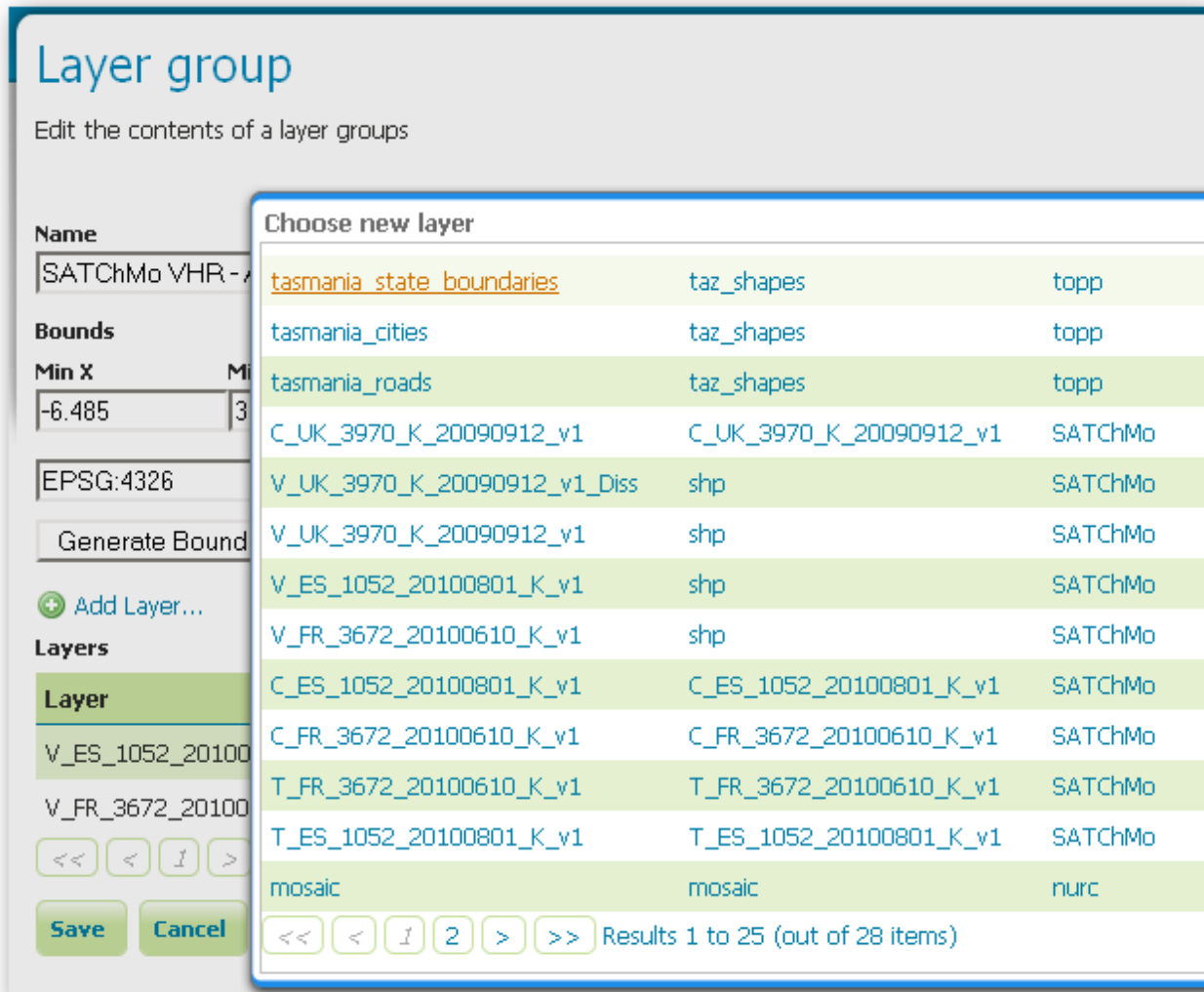


Figure 16: Add layers to the group

Repeat “Add layer...” for all layers you want to add. When done – press “Save” button.

3.7 SECURITY CONSIDERATIONS

As always, there are essential rules to follow while dealing with internet servers. For security considerations, see the GeoServer user manual:

<http://docs.geoserver.org/stable/en/user/security/index.html>

4 CREATE METADATA RECORDS

Before going into details of metadata creation, we need to define the “minimum” set of G2 requirements related with publishing the projects data and metadata. Due to the formal requirement to deliver the datasets as downloadable files (archives) to the G2 clients, also for the purpose of data exchange between partners, it was decided that archived dataset files will be published on “download” services (FTP/HTTP) by the data providers. To make those datasets “discoverable”, a central catalogue is established on G2 portal, where metadata records on all downloadable datasets are searched and download links, as well as dataset quicklooks, are provided to the clients through those dataset metadata records. This part of SDI implementation is completely under the responsibility of the data providers.

In order to structure the massive amount of G2 metadata, it was decided to create thematic G2 metadata search services on the G2 portal. Those services are defined by service metadata records, created by project partners maintaining metadata CSW catalogues where all dataset metadata records from data providers are published. Those partners hosting G2 “component catalogs” also maintain their metadata search services on the G2 portal. For instance, AGI has established a metadata service catalog called “SATChMo VHR Land Cover Dataset Catalogue” on G2 portal and connected it to a CSW metadata dataset catalogue hosted on AGI CSW server. AGI will also maintain the G2 configures the G2 “SATChMo VHR Land Cover Dataset Catalogue” setup while dataset metadata XML records and URLs of newly established WMS services will be sent to AGI by the SATChMo data providers.

After a considerable effort within G2 SDI team and data providers to find a reasonable solution for creation/editing of metadata, it was decided that the best option would be to create a new on-line application for metadata creation and editing, that would be compliant with the INSPIRE specifications and fully satisfy the needs of the project. Therefore it is **HIGHLY RECOMMENDED** to use GMES metadata editor for creating metadata records for the datasets containing SATChMo VHR Land Cover Data classification results. The following chapters will describe and illustrate the whole procedure of metadata creation based on a real example of one of AGI SATChMo VHR datasets. You can follow this example closely with only minor simple changes to be included while creating your own metadata records.

Although Deegree CSW 2.4 has it's own catalogueManager metadata editor, **DO NOT** use it for creating or editing G2 metadata records - it does not support all required fields. catalogueManager editor can be used to delete unnecessary metadata records from CSW, and Deegree catalogueManager search - to display what records are served by CSW.

4.1 LOGGING IN, CREATING NEW GROUP

If you are a new metadata provider, you will first of all need to register on the Geoland2 Expert Portal at <http://www.geoland2.eu> before starting to create your own metadata records. Registration is free and rather simple, so we will not focus on that in detail.

After completing your registration, open the G2 GMES metadata editor page on <http://land.eu/gmes-metadata-editor/login/auth> and log in. Metadata records are organized by assigning them to appropriate group, so first thing you will have to do is create new group for metadata records on your SATChMo VHR Land Cover datasets.

To create a metadata group, select Goup/Create from the right side menu, add the name, description and save changes. Note that you will need to select a parent group if your dataset groups are arranged into some complicated hierarchy. In our generic case this option may be ignored.

Wherever you see fields marked with red arrows and colour, please be careful to provide the requested information there – those metadata fields are obligatory!

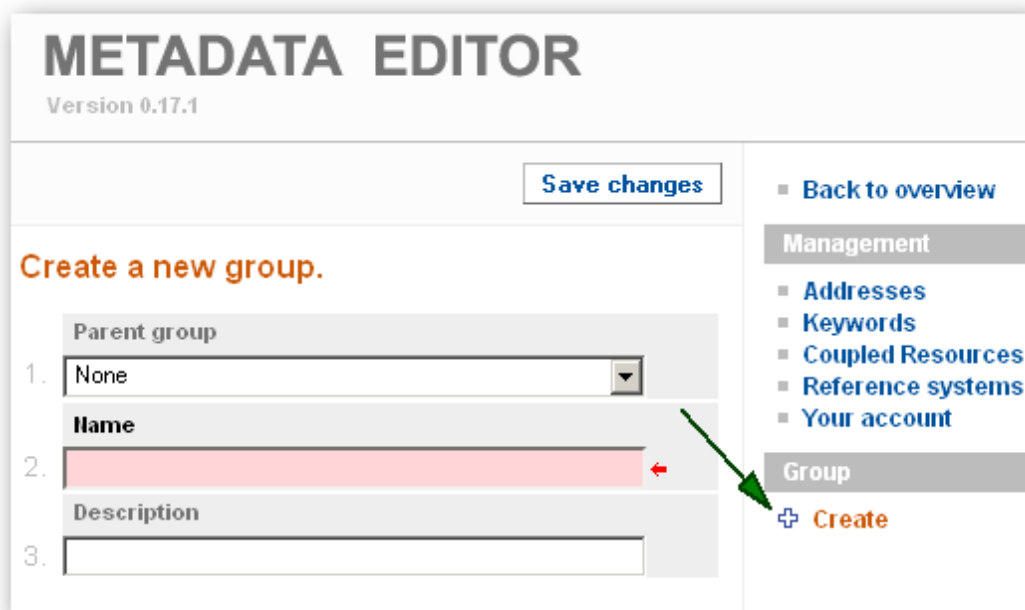


Figure 17: Creating new group for SATChMo datasets

Fill in required information, then press „Save changes“. Press „Back to overview“ - you can see new just created group.

4.2 UPLOADING DATASET SERIES XML FILE

For creating a searchable thematic metadata catalog (e.g. for SATChMo datasets) on the G2 Portal, it is necessary to create a so-called dataset series metadata XML file. This initial operation is done by the partner hosting the corresponding datasets metadata catalog (in case of SATChMo VHR that would be AGI). But it is also essential that all the data providers load this metadata series XML document into their GMES metadata editor workspaces before starting to create their own dataset metadata XML documents, which will need a „Parent ID“ field to be filled in by simply pointing to that previously imported dataset series metadata record.

The dataset series metadata XML record is like a „summary“ of all datasets which will be present in that series. Structurally this XML file is identical to the datasets metadata XML files. However, there is one essential difference. Dataset series defines a so-called „Parent ID“ code, which must be further replicated in all the dataset metadata XML files as their „parent“ identifier. This code is the only XML element binding all metadata records into a certain searchable „series“ on the G2 Portal, although all those datasets and corresponding metadata documents are produced independently by different data providers.

GMES metadata editor does not allow to edit metadata file identifiers – they are generated automatically. To ensure, that correct metadata parent identifier is assigned to all dataset metadata records belonging to the same dataset series, the original dataset series metadata XML document with a unique file identifier („parent ID“) must be uploaded to the group by each data provider in their GMES metadata editor environments. See [Appendix 1](#) for the metadata XML file contents, and contact AGI for a digital copy of the dataset series metadata XML file called `SATChMo_VHR_Land_Cover_Data.xml`, or just re-create it by copy-pasting the text from the Appendix 1.

In the overview window (if you are not there – press „Back to overview“ link), select your group, then in the right side menu select „Collection (series) Document – Import from XML“.

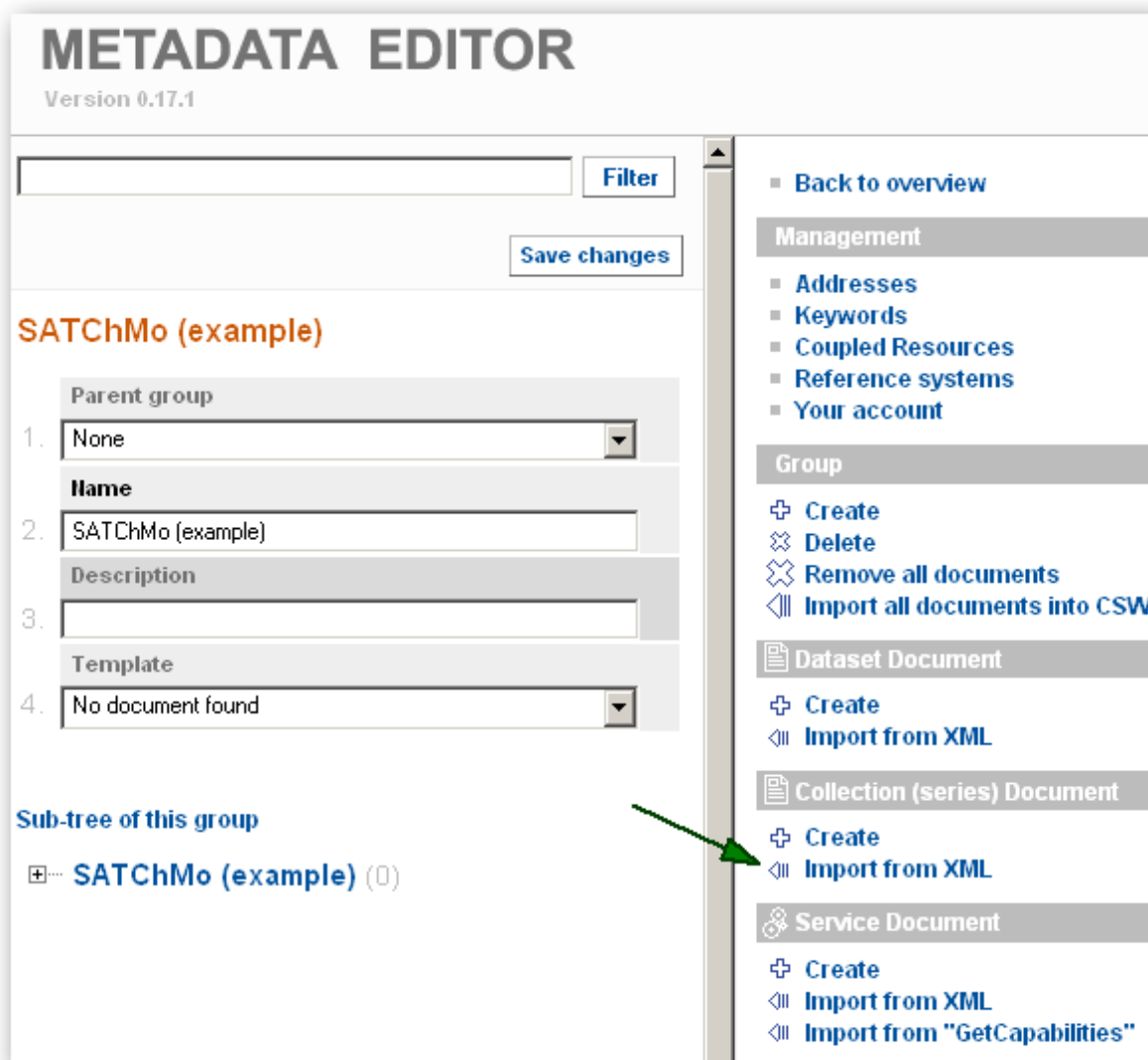


Figure 18: Importing dataset series XML file

In next page, click „Browse“, select SATChMo VHR Land Cover Data.xml file. Then press „Import from XML“ button above.



Figure 19: Uploading dataset series XML file

Parent document uploaded, now you will be able to refer to it in your datasets metadata.

4.3 CREATING DATASET METADATA DOCUMENT

Now you are ready to start creating metadata records for your own SATChMo VHR datasets. The whole process is really simple and straightforward, it is also quite nicely documented (see the left column on the metadata editor application window – it will be interactively changing with short descriptions as you navigate over the certain fields). The obligatory fields are marked with red color and arrows, but we strongly recommend to fill in as much information as possible. If you do so for the first metadata record, you will be able to save it as XML document, load again and use as a template for the following records, with only minor changes to be made (as the datasets will be thematically identical). This is a really good practice which would save you a lot of time and improve the overall quality of your metadata.

To start creating a new dataset metadata record, return to overview, then select group where you want to create metadata for dataset. In the right side menu select „Dataset document – Create“.

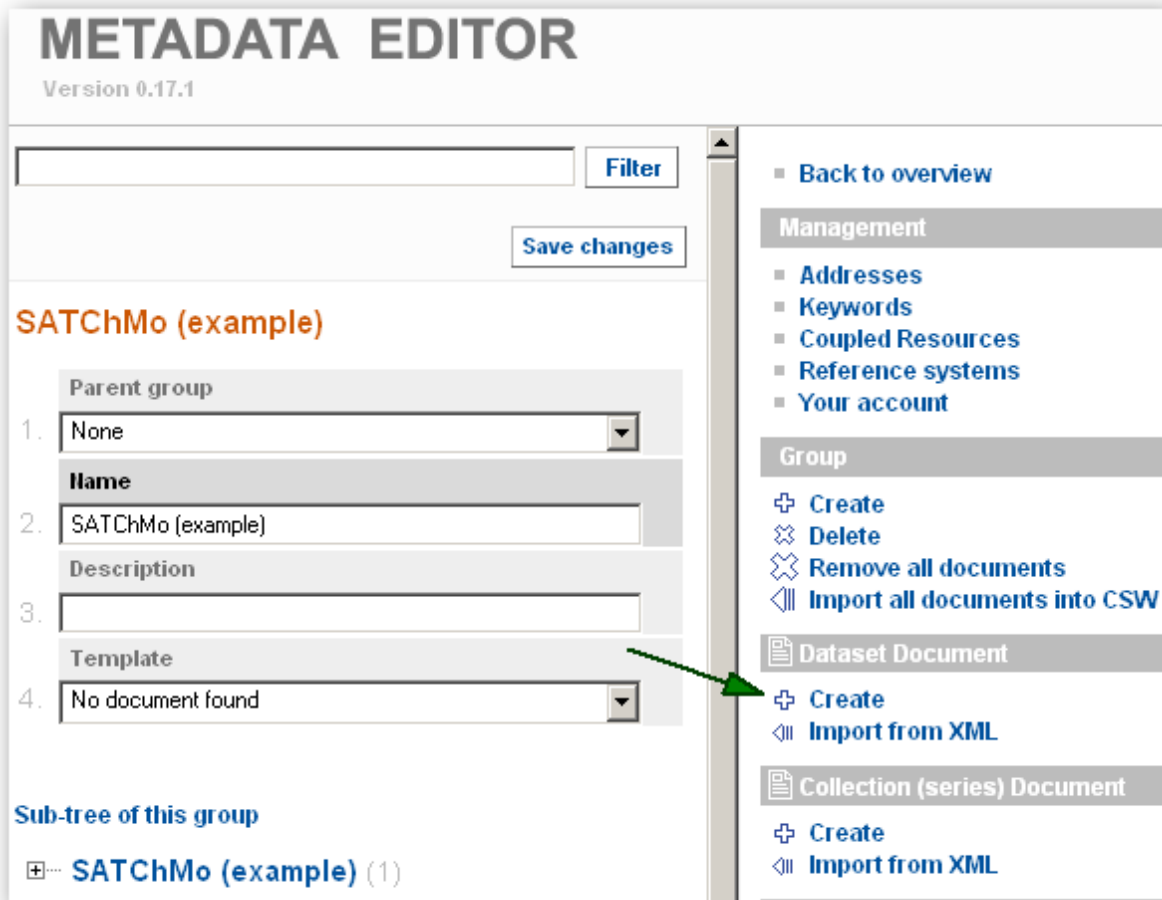


Figure 20: Creating dataset metadata document

In the next page, do not forget to select correct „Metadata parent identifier“! Also, because metadata editor is web based, press „Save changes“ every few minutes – when there are no activity for a certain period of inactivity, the editing session will expire and you will have to log in again (unsaved data, of course, will be lost in this case).

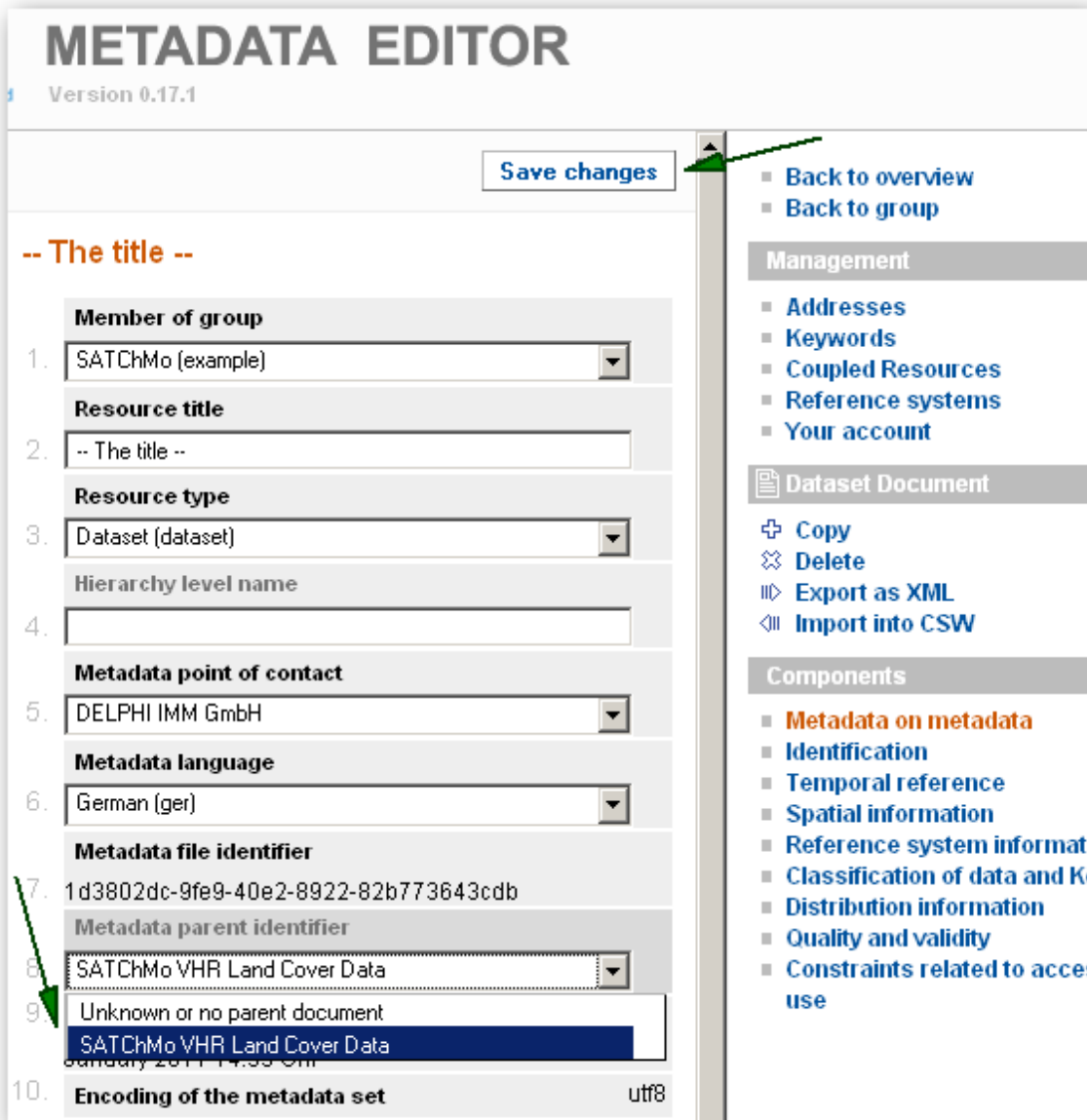


Figure 21: Selecting proper metadata parent identifier

Below we present an example of how a dataset document is created, based on a real ES_1052_20100801_K_v1 dataset produced by AGI. Please fill in the fields of your metadata records accordingly.

4.3.1 Metadata on metadata

ES_1052_20100801_K_v1

Member of group	
1.	SATChMo
Resource title	
2.	ES_1052_20100801_K_v1
Resource type	
3.	Dataset (dataset)
Hierarchy level name	
4.	SATChMo VHR LC dataset
Metadata point of contact	
5.	Gedas Vaitkus - Aerogeodezijos institutas UAB
Metadata language	
6.	English (eng)
Metadata file identifier	
7.	3fd6423d-ee6f-4e0d-a142-5b5901511445
Metadata parent identifier	
8.	SATChMo VHR Land Cover Data
9.	Metadata date 21. December 2010 11:03 Uhr
10.	Encoding of the metadata set utf8
11.	Metadata standard name ISO 19115:2003, 19119:2006 (LMCS profile)
12.	Metadata standard version 1.0
Metadata maintenance	
13.	N/A
Ready for import in geoland2-CSW?	
14.	Ready for geoland2-CSW import

- [Back to overview](#)

Management

- [Addresses](#)
- [Keywords](#)
- [Coupled Resources](#)
- [Reference systems](#)
- [Your account](#)

Dataset Document

- ✚ [Copy](#)
- ✕ [Delete](#)
- ⌄ [Export as XML](#)
- ⏪ [Import into CSW](#)

Components

- **Metadata on metadata**
- [Identification](#)
- [Temporal reference](#)
- [Spatial information](#)
- [Reference system information](#)
- [Classification of data and Keyword](#)
- [Distribution information](#)
- [Quality and validity](#)
- [Constraints related to access and use](#)

Figure 22: Metadata on metadata

4.3.2 Identification

ES_1052_20100801_K_v1

Abstract and title

Resource abstract	SATChMo VHR Land Cover classification product. Production method - automated image processing (Definiens algorithm by IGIL) and further manual re-coding. Source image - KOMPSAT2. Date - 01.08.2010. Area - near Seville (Spain). Codes and class names used in the classification: 1 = 06_Forest_woodland_trees; 2 = 1_Urban_artificial; 3 = 03_Water; 5 = 02_Bare ground; 8 = 05_Agricultural_areas; 13 = 04_Snow_and_ice; 14 = 09_Other_vegetation; 15 = 10_Cloud_voids_etc; 16 = 08_Grassland; 17 = 07_Sparse_woody_vegetation.
1.	
2.	Alternate resource title(s)

Information about the dataset

Responsible organisation	CVB (Image Processing Centre for SPOT-VGT) - VITO (F) Daniela Iasillo - Planetek Italia srl Daniel Langhans - Infoterra GmbH Daniel Langhans - Infoterra GmbH David Herrmann - GAF AG Elisabeth Schmeer - Infoterra GmbH Erwin Goor - Flemish Institute for Technological Research Gedas Vaitkus - Aerogeodezijos institutas UAB GMES Services Coordinated Interface - ESA - European Isabelle Piccard - VITO (Flemish Institute for Technologic
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Figure 23: Identification (part 1)

Resource abstract is a critically important field in the metadata record. It will show up in all metadata search engines presented along with your dataset title. Please be careful to briefly, but clearly define your datasets here. Please note that the classification schema (class names and codes) will only be listed within this field – there is no other place in the metadata document to do that. The same is for reference data (source imagery), classification methodology, post-processing, etc.

2.	Production centre	Institute of Aerial Geodesy (AGI)
3.	Version	1
4.	Version date	01.12.2010
5.	Credit	Irina Pakrosnienė, Evgenia Gurova
6.	Resource locator	http://www.agi.lt/SATChMo/ES_1052_20100801_K_v1.zi
7.	Online function	Download (download) <input type="button" value="v"/>
8.	Purpose	Compressed polygon coverage, thematic raster with colour
9.	Status of the collection / product	Completed (completed) <input type="button" value="v"/>
10.	URL quicklook	http://www.agi.lt/SATChMo/ql_C_ES_1052_20100801_K_

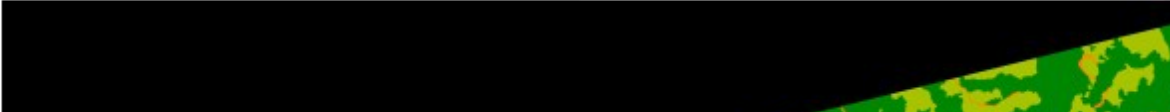


Figure 24: Identification (part 2)

11.	URL documents	
12.	Maintenance frequency	N/A
13.	Maintenance note	
14.	Supplemental information	
15.	Unique resource identifier	3fd6423d-ee6f-4e0d-a142-5b5901511445
Further information about the dataset		
1.	Equivalent scale 1:	10000
2.	Distance	
3.	Unit of the distance	
4.	Spatial representation type	<ul style="list-style-type: none"> Grid (grid) Stereo model (stereoModel) Table (textTable) TIN (tin) Vector (vector) Video (video)
5.	Platform	
6.	Sensor	
7.	Topic Category	<ul style="list-style-type: none"> Farming (farming) Biota (biota) Boundaries (boundaries) Meteorology (climatologyMeteorologyAtmosphere) Economy (economy) Elevations (elevation) Environment (environment) Geoscientific information (geoscientificinformation) Health (health) Base maps (imageryBaseMapsEarthCover) Military (intelligenceMilitary) Inland waters (inlandWaters) Location (location) Oceans (oceans) Cadastre (planningCadastre) Society (society) Structure (structure) Transportation (transportation) Utilities communication (utilitiesCommunication)
8.	Resource language	English (eng)
9.	Encoding of the dataset	UTF-8 (utf8)

Figure 25: Identification (part 3)

4.3.3 Temporal reference

METADATA EDITOR

Version 0.17.1

[Save changes](#)

ES_1052_20100801_K_v1

1.	Date of creation	<input type="text" value="01.12.2010"/>
2.	Date of last revision	<input type="text"/>
3.	Date of publication	<input type="text" value="01.12.2010"/>
4.	Temporal extent, begin	<input type="text"/>
5.	Temporal extent, end	<input type="text"/>
6.	Time instant	<input type="text"/>
7.	Description of temporal information	<input type="text"/>

Figure 26: Temporal reference

4.3.4 Spatial information

METADATA EDITOR

Version 0.17.1

ES_1052_20100801_K_v1

Shift - Left Click : Zoom-in | Ctrl - Left click: Change coordinates (Bounding box)

Geographic Bounding Box

1.	Location selector	N/A
2.	Western longitude	-6.485
3.	Eastern longitude	-6.268
4.	Southern latitude	37.379
5.	Northern latitude	37.555

Figure 27: Spatial information

The bounding box can be calculated automatically.

4.3.5 Reference system information

METADATA EDITOR

Version 0.17.1

Filter

ES_1052_20100801_K_v1

Reference system(s) in metadata document

1 reference system

Selection	Code	Code space	Version
<input type="checkbox"/>	32629	EPSG	

Remove from metadata set

Available reference systems

1 to 10 of all in all 15 reference system(s) found.

Selection	Code	Code space	Version
<input type="checkbox"/>	2065	EPSG	
<input type="checkbox"/>	2169	EPSG	
<input type="checkbox"/>	23700	EPSG	
<input type="checkbox"/>	3035	EPSG	
<input type="checkbox"/>	31287	EPSG	
<input type="checkbox"/>	32629	EPSG	
<input type="checkbox"/>	32632	EPSG	WGS84 UTM zone 32N
<input type="checkbox"/>	4325	EPSG	WGS84 UTM Zone 33 North
<input type="checkbox"/>	4326	EPSG	
<input type="checkbox"/>	France (NTF) Zone II etendu	France (NTF) Zone II etendu	

1 2 Next

Add to metadata set

Figure 28: Reference system information

Note, that different datasets may be in different reference systems! If there is no CRS of your particular dataset in this list, you can easily define one. The only thing to know is the EPSG code of the CRS used in your dataset.

4.3.6 Classification of data and keywords

METADATA EDITOR

Version 0.17.1

Items
Type

ES_1052_20100801_K_v1

Keyword(s) in metadata document

3 keywords

Selection	Keyword	Type
<input type="checkbox"/>	habitats and biotopes	Inspire dataset
<input type="checkbox"/>	land cover	Inspire dataset
<input type="checkbox"/>	land use	Inspire dataset

Available keywords

1 to 10 of all in all 35 keyword(s) found.

Selection	Keyword	Type
<input type="checkbox"/>	addresses	Inspire dataset
<input type="checkbox"/>	administrative units	Inspire dataset
<input type="checkbox"/>	agricultural and aquaculture facilities	Inspire dataset
<input type="checkbox"/>	area management/restriction/regulation zones and reporting units	Inspire dataset
<input type="checkbox"/>	atmospheric conditions	Inspire dataset
<input type="checkbox"/>	bio-geographical regions	Inspire dataset
<input type="checkbox"/>	biophysical variable	Inspire dataset
<input type="checkbox"/>	buildings	Inspire dataset
<input type="checkbox"/>	cadastral parcels	Inspire dataset
<input type="checkbox"/>	coordinate reference systems	Inspire dataset

1
2
3
4
Next

Figure 29: Classification of data and keywords

Keywords used in all the dataset metadata records within a certain dataset series should be the same, so this issue should be discussed by the production team and a clear recommendation made on how this part of metadata should be filled in.

4.3.7 Distribution information

METADATA EDITOR

Version 0.17.1

ES_1052_20100801_K_v1

1.	Responsible party for distribution	Gedas Vaitkus - Aerogeodezijos institutas UAB
2.	Costs	free of charge
3.	Delivery time	5 days
4.	Ordering instructions	contact by e-mail (gedas at agi.lt)

1.	Product format	SHP, TIFF
2.	Version of product format	1
3.	Distribution format	ZIP
4.	Version of distribution format	1
5.	Specification of distribution format	
6.	Decompression technique of distribution format	unzip

Figure 30: Distribution information

4.3.8 Quality and validity

METADATA EDITOR

Version 0.17.1

ES_1052_20100801_K_v1

General information

1.	Lineage	AFS
----	----------------	-----

Quality reports

1.	Positional accuracy	
2.	Unit of positional accuracy	meter ▼
3.	Minimum mapping unit	0.25 ha

1.	Dataset completeness result	100.0
2.	Unit of completeness result	percent ▼
3.	Validation results	

1.	Thematic accuracy	
----	--------------------------	--

Reference information

1.	Reference Point	
2.	Reference	N/A ▼

Figure 31: Quality and validity

4.3.9 Constraints related to access and use

METADATA EDITOR

Version 0.17.1

ES_1052_20100801_K_v1

1.	Use Limitations	NONE
2.	Limitations on public access	Copyright (copyright) ▼
3.	Reference to use constraints	N/A ▼
4.	Other constraints	NONE
5.	Security constraints	Unclassified (unclassified) ▼

Figure 32: Constraints related to access and use

4.4 EXPORTING TO XML DATASET METADATA DOCUMENT

After filling in the required fields, dataset document is ready to be saved in XML format. To do that, return to overview, go to group and select the document you want to save as XML file.

Navigation info

This component allows modifying and editing general information describing the metadata set.

Status

The metadata set "ES_1052_20100801_K_v1" has been selected.

Help

ES_1052_20100801_K_v1

1.	Member of group	SATChMo
2.	Resource title	ES_1052_201008
3.	Resource type	Dataset (dataset)
4.	Hierarchy level name	SATChMo VHR L
5.	Metadata point of contact	Gedas Vaitkus - A
6.	Metadata language	English (eng)
7.	Metadata file identifier	3fd6423d-ee6f-4
8.	Metadata parent identifier	SATChMo VHR L

Figure 33: Selecting document to export as XML

Then select „Dataset document – Export as XML“ in the right-side menu bar. After that, save that page, selecting „File – Save Page As“/“File – Save As“ in the web browser menu.

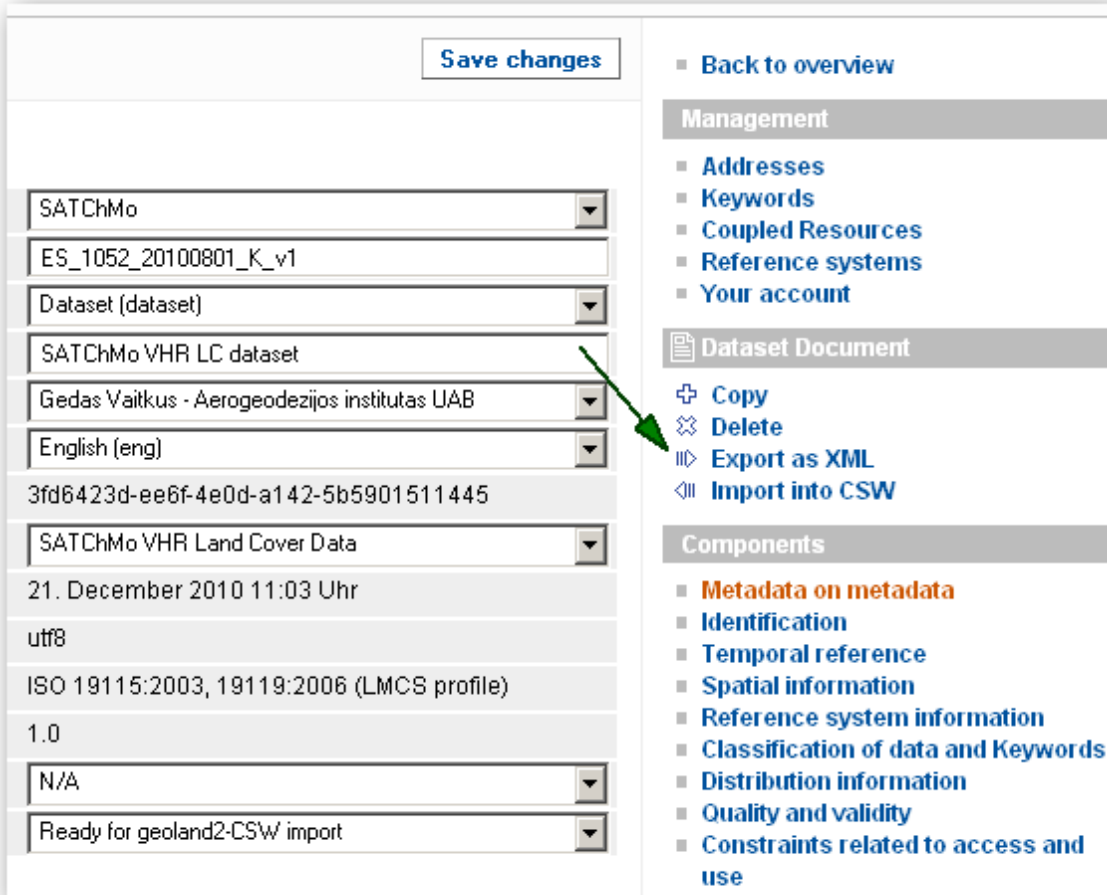


Figure 34: Export as XML

The resulting XML file should be sent to SATChMo CSW server administrators at AGI for uploading into their CSW server.

5 PUBLISH METADATA RECORDS (OPTIONAL)

This section is provided for reference only - SATChMo dataset metadata records will be hosted by AGI on its CSW server.

5.1 UPLOAD METADATA XML FILES TO CSW

Metadata XML file to Deegree CSW server can be uploaded using it's Generic OGC WebService Client. Navigate to

`http://your.server.name:8080/deegree-csw/client/client.html`

Then prepare request field to insert data - replace it with these lines:

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:Transaction service="CSW" version="2.0.2"
xmlns:csw="http://www.opengis.net/cat/csw/2.0.2">
  <csw:Insert>

  </csw:Insert>
</csw:Transaction>
```




Figure 35: Prepare request field to insert data

Then copy/paste your XML file contents (except first line - "<?xml version="1.0" encoding="UTF-8"?>") between <csw:Insert> and </csw:Insert> tags.

Press SEND button. If record was inserted successfully, there should be `<csw:totalInserted>1</csw:totalInserted>` line in transaction response.

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

- <csw:TransactionResponse version="2.0.2">
  - <csw:TransactionSummary>
    <csw:totalInserted>1</csw:totalInserted>
    <csw:totalUpdated>0</csw:totalUpdated>
    <csw:totalDeleted>0</csw:totalDeleted>
  </csw:TransactionSummary>
  - <csw:InsertResult>
    - <csw:BriefRecord>
      <dc:identifier>2825a96c-1b75-49d3-bdcc-2e972eedcfa8</dc:identifier>
      <dc:title> SATChMo VHR Land Cover Data </dc:title>
    </csw:BriefRecord>
  </csw:InsertResult>
</csw:TransactionResponse>

```

Figure 36: Transaction summary

5.2 LIST METADATA RECORDS, UPLOADED TO CSW

There are two ways to view, what metadata records are uploaded to Deegree CSW:

1. In Generic OGC WebService Client execute "GetRecords_title.xml" request.
2. Use Deegree catalogueManager search.

5.2.1 Generic client

Navigate to

`http://your.server.name:8080/deegree-csw/client/client.html`, then select and execute "GetRecords_title.xml" request. `<gmd:MD_Metadata>` fields can be expanded to view more detailed information.

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

- <csw:GetRecordsResponse version="2.0.2">
  <csw:RequestId>11</csw:RequestId>
  <csw:SearchStatus timestamp="2011-04-16T22:25:50.000"/>
  - <csw:SearchResults expires="2011-04-16T22:25:50.363" nextRecord="3" numberOfRecordsMatched="2" numberOfRecordsReturned="2"
    recordSchema="http://192.168.1.142:8080/deegree-csw/services?service=CSW&version=2.0.2&request=DescribeRecord&typeName=%7Bhttp://www.isotc211.org/2005/gmd%7DMD_Metadata">
    + <gmd:MD_Metadata></gmd:MD_Metadata>
    + <gmd:MD_Metadata></gmd:MD_Metadata>
  </csw:SearchResults>
</csw:GetRecordsResponse>
    
```

Figure 37: Generic client

5.2.2 catalogueManager search

Starting with Deegree CSW 2.4, there is new tool available - catalogueManager. It is a collection of client and server applications for managing ISO and INSPIRE compliant metadata. It provides HTTP/SOAP interfaces for searching, accessing, harvesting and manipulating metadata for geographic data and services. Metadata can be searched by their title, topic, date etc. and the spatial extent of the described data/service. deegree supports Dublin Core and INSPIRE compliant ISO 19115/19119/19139 metadata encoding. If the ISO metadata format is used, data metadata and service metadata can be coupled. This enables a user to first search for data metadata matching, for example, a specific topic and area and then finding a WMS, WFS etc. serving the data described by the data metadata sets matching the initial search.

Search client can be accessed at

`http://your.server.name:8080/deegree-csw/md_search.jsp`

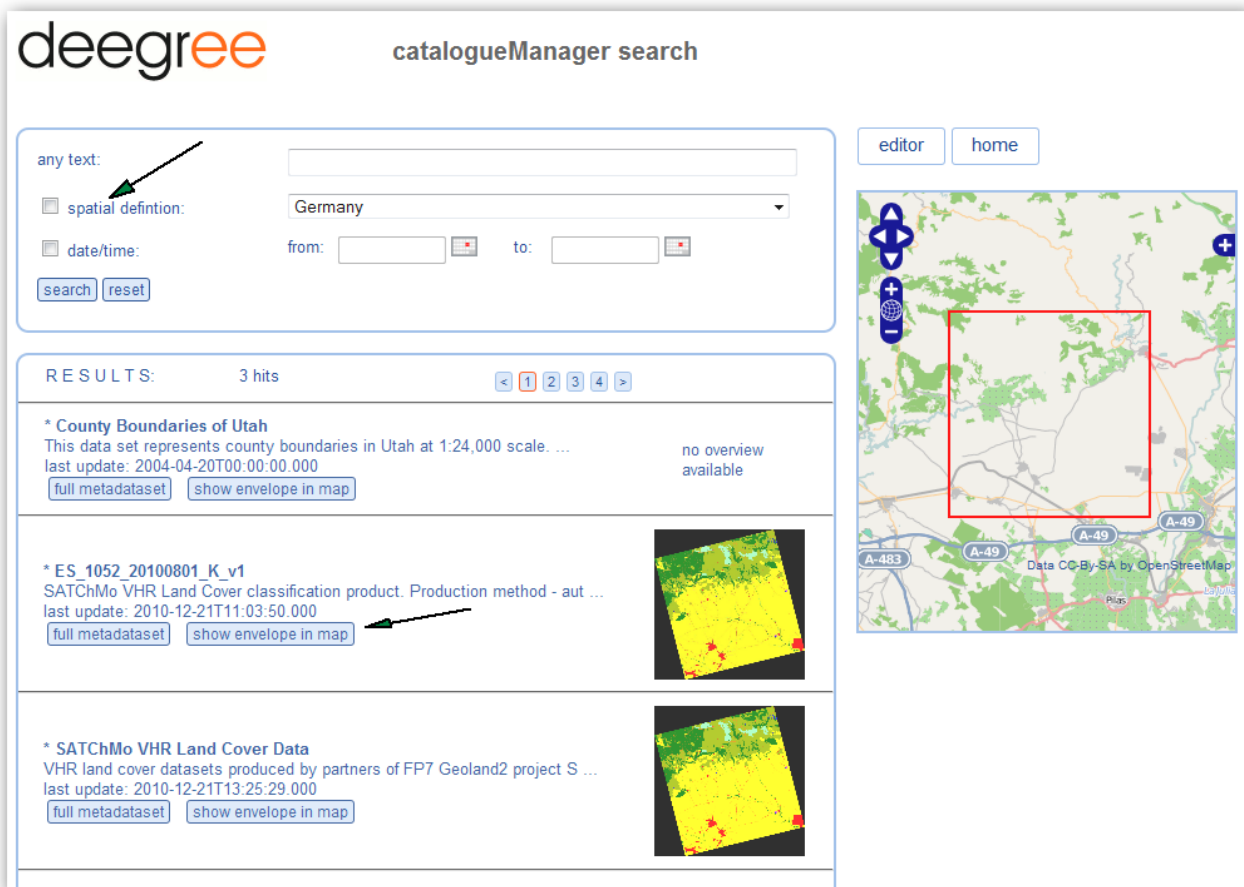


Figure 38: catalogueManager search

Since catalogueManager is very recent addition to Deegree CSW, it's functionality is quite limited. It can search by text and date (search by spatial definition is restricted to Germany, Utah and Hessen).

"show envelope in map" button displays data, described by metadata, location in the map on the right side.

5.3 DELETE METADATA RECORDS FROM CSW

Metadata records from Deegree CSW can be deleted using generic client or catalogueManager editor.

5.3.1 Generic client

Navigate to

`http://your.server.name:8080/deegree-csw/client/client.html`, then select "delete.xml" request. Replace "%" in `<ogc:Literal>%</ogc:Literal>` with file identifier of record you want to delete. Press SEND button.

deegree Generic OGC Webservice Client

Service URL:

Choose example request: Example: Request:

```

/csw:Delete
  <csw:Constraint version="1.1.0">
    <ogc:Filter>
      <ogc:PropertyIsLike wildCard="*" singleChar="_" escapeChar="/">
        <ogc:PropertyName>apiso:identifier</ogc:PropertyName>
        <ogc:Literal>{42AE2814-FCC1-4BC2-BAF4-CA3E55514997}</ogc:Literal>
      </ogc:PropertyIsLike>
    </ogc:Filter>
  </csw:Constraint>
    
```

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

<csw:TransactionResponse version="2.0.2">
  <csw:TransactionSummary>
    <csw:totalInserted>0</csw:totalInserted>
    <csw:totalUpdated>0</csw:totalUpdated>
    <csw:totalDeleted>1</csw:totalDeleted>
  </csw:TransactionSummary>
  <csw:InsertResult>
    <csw:BriefRecord>
      <dc:identifier>bogus</dc:identifier>
    </csw:BriefRecord>
  </csw:InsertResult>
</csw:TransactionResponse>
    
```

Figure 39: Delete records from generic client

5.3.2 catalogueManager editor

Deegree 2.4 catalogueManager editor is NOT suitable for metadata editing. However, it can be used to delete existing records in CSW:

1. Press "Edit existing metadata set" button.
2. New window with metadata records list will open. Select desired record.
3. Press "ubernehmen" button.

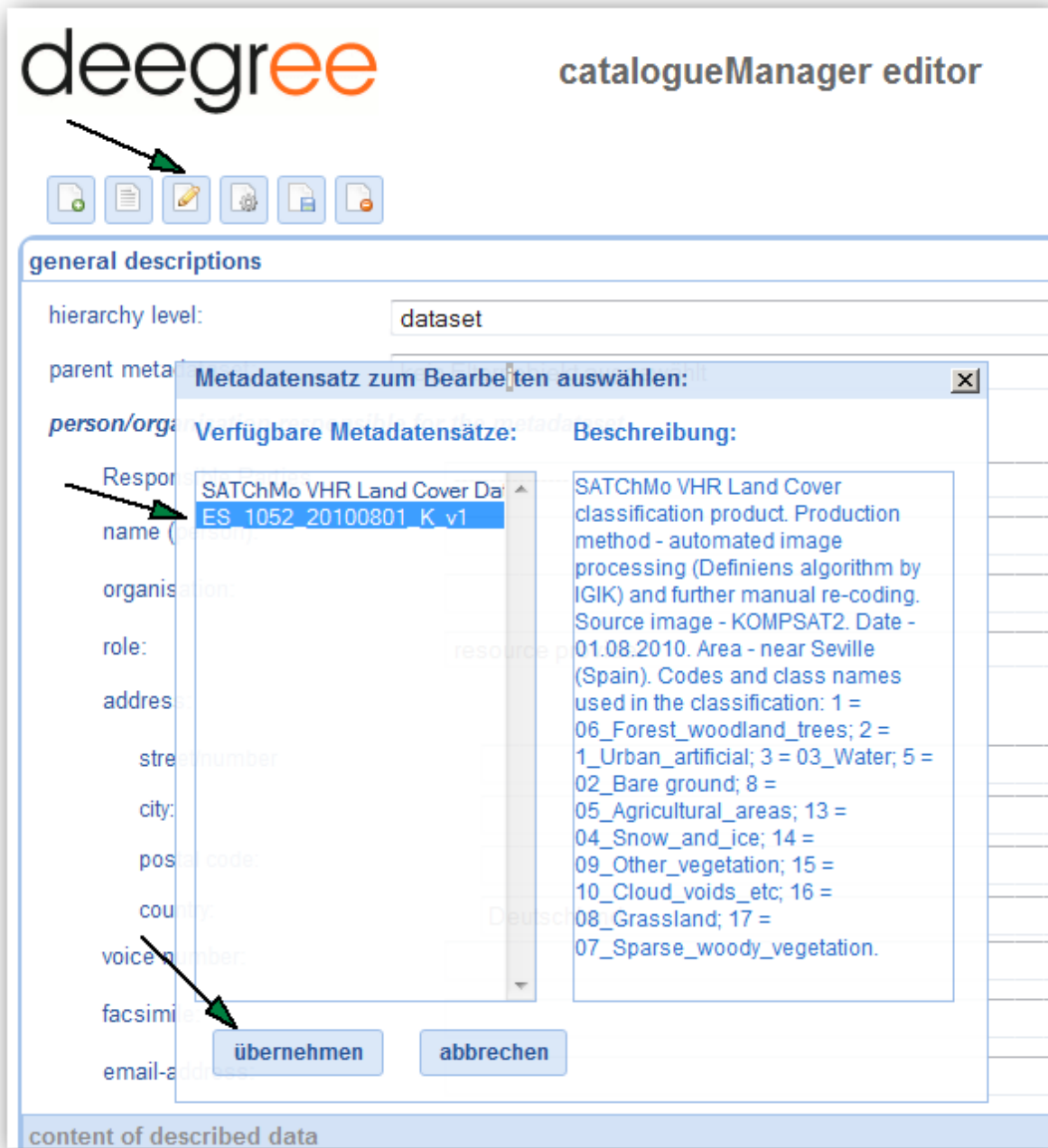


Figure 40: catalogueManager editor

4. Then, press "delete metadataset" button. Confirm your choice by pressing "OK" button.



Figure 41: Delete metadata set

6 TECHNICAL SUPPORT

A limited technical support on installation, configuration and maintenance of AGI SDI Server will be provided free of charge within FP7 "Geoland 2" project. Requests for technical support, comments, inquiries and suggestions and can be addressed to the main designer of this system, who is also responsible for it's further development:

Dr. Gediminas VAITKUS

Applied Research Center

UAB "Aerogeodezijos institutas"

Pramones pr. 13

LT-51327 Kaunas

LITHUANIA

tel.: +370-37-755226

fax.: +370-37-451497

mob.: +370-620-72870

e-mail: gedas.vaitkus@gmail.com

7 ANNEX 1 – SATCHMO VHR LAND COVER DATA.XML

```

<?xml version="1.0" encoding="UTF-8"?>
<gmd:MD_Metadata xmlns:gml="http://www.opengis.net/gml"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns="http://www.isotc211.org/2005/gmd"
xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:gmd="http://www.isotc211.org/2005/gmd">
  <gmd:fileIdentifier>
    <gco:CharacterString>PARENT ID - ask service provider</gco:CharacterString>
  </gmd:fileIdentifier>
  <gmd:language>
    <gco:CharacterString>eng</gco:CharacterString>
  </gmd:language>
  <gmd:characterSet>
    <gmd:MD_CharacterSetCode codeList="MD_CharacterSetCode"
codeListValue="utf8">utf8</gmd:MD_CharacterSetCode>
  </gmd:characterSet>
  <gmd:hierarchyLevel>
    <gmd:MD_ScopeCode codeList="MD_ScopeCode"
codeListValue="series">series</gmd:MD_ScopeCode>
  </gmd:hierarchyLevel>
  <gmd:hierarchyLevelName>
    <gco:CharacterString>Put hierarchy level here</gco:CharacterString>
  </gmd:hierarchyLevelName>
  <gmd:contact>
    <gmd:CI_ResponsibleParty>
      <gmd:individualName>
        <gco:CharacterString>Gedas Vaitkus</gco:CharacterString>
      </gmd:individualName>
      <gmd:organisationName>
        <gco:CharacterString>Aerogeodezijos institutas
UAB</gco:CharacterString>
      </gmd:organisationName>
      <gmd:contactInfo>
        <gmd:CI_Contact>
          <gmd:phone>
            <gmd:CI_Telephone>
              <gmd:voice>
                <gco:CharacterString>+370-37-755226</gco:CharacterString>
              </gmd:voice>
              <gmd:facsimile>
                <gco:CharacterString>-370-37-451497</gco:CharacterString>
              </gmd:facsimile>
            </gmd:CI_Telephone>
          </gmd:phone>
          <gmd:address>
            <gmd:CI_Address>
              <gmd:deliveryPoint>

```

```

        <gco:CharacterString>Pramones pr. 13</gco:CharacterString>
    </gmd:deliveryPoint>
    <gmd:city>
        <gco:CharacterString>Kaunas</gco:CharacterString>
    </gmd:city>
    <gmd:postalCode>
        <gco:CharacterString>51327</gco:CharacterString>
    </gmd:postalCode>
    <gmd:country>
        <gco:CharacterString>Lithuania</gco:CharacterString>
    </gmd:country>
    <gmd:electronicMailAddress>
        <gco:CharacterString>gedas@agi.lt</gco:CharacterString>
    </gmd:electronicMailAddress>
    </gmd:CI_Address>
    </gmd:address>
    </gmd:CI_Contact>
    </gmd:contactInfo>
    <gmd:role>
        <gmd:CI_RoleCode codeList="CI_RoleCode"
codeListValue="pointOfContact">pointOfContact</gmd:CI_RoleCode>
    </gmd:role>
    </gmd:CI_ResponsibleParty>
    </gmd:contact>
    <gmd:dateStamp>
        <gco:DateTime>2010-12-21T13:25:29</gco:DateTime>
    </gmd:dateStamp>
    <gmd:metadataStandardName>
        <gco:CharacterString>ISO 19115:2003, 19119:2006 (LMCS
profile)</gco:CharacterString>
    </gmd:metadataStandardName>
    <gmd:metadataStandardVersion>
        <gco:CharacterString>1.0</gco:CharacterString>
    </gmd:metadataStandardVersion>
    <gmd:referenceSystemInfo>
        <gmd:MD_ReferenceSystem>
            <gmd:referenceSystemIdentifier>
                <gmd:RS_Identifier>
                    <gmd:code>
                        <gco:CharacterString>4326</gco:CharacterString>
                    </gmd:code>
                    <gmd:codeSpace>
                        <gco:CharacterString>EPSG</gco:CharacterString>
                    </gmd:codeSpace>
                </gmd:RS_Identifier>
            </gmd:referenceSystemIdentifier>
        </gmd:MD_ReferenceSystem>
    </gmd:referenceSystemInfo>
    <gmd:identificationInfo>

```

```

<gmd:MD_DataIdentification uuid="2825a96c-1b75-49d3-bdcc-2e972eedcfa8">
  <gmd:citation>
    <gmd:CI_Citation>
      <gmd:title>
        <gco:CharacterString>SATChMo VHR Land Cover
Data</gco:CharacterString>
      </gmd:title>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:DateTime>2010-12-21T00:00:00</gco:DateTime>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode codeList="CI_DateTypeCode"
codeListValue="publication">publication</gmd:CI_DateTypeCode>
          </gmd:dateType>
        </gmd:CI_Date>
      </gmd:date>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:DateTime>2010-12-21T00:00:00</gco:DateTime>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode codeList="CI_DateTypeCode"
codeListValue="revision">revision</gmd:CI_DateTypeCode>
          </gmd:dateType>
        </gmd:CI_Date>
      </gmd:date>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:DateTime>2010-12-15T00:00:00</gco:DateTime>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode codeList="CI_DateTypeCode"
codeListValue="creation">creation</gmd:CI_DateTypeCode>
          </gmd:dateType>
        </gmd:CI_Date>
      </gmd:date>
    </gmd:edition>
    <gco:CharacterString>1.0</gco:CharacterString>
  </gmd:edition>
  <gmd:editionDate>
    <gco>Date>2010-12-21</gco>Date>
  </gmd:editionDate>
  <gmd:identifier>
    <gmd:MD_Identifier>
      <gmd:authority>

```

```

    <gmd:CI_Citation>
      <gmd:title><gco:CharacterString>Institute of Aerial Geodesy
(AGI)</gco:CharacterString></gmd:title>
      <gmd:date />
    </gmd:CI_Citation>
  </gmd:authority>
  <gmd:code>
    <gco:CharacterString>2825a96c-1b75-49d3-bdcc-
2e972eedcfa8</gco:CharacterString>
  </gmd:code>
  </gmd:MD_Identifier>
</gmd:identifier>
  <gmd:otherCitationDetails>
    <gco:CharacterString>http://www.gmes-
geoland.info/fileadmin/geoland2/redakteur/pdf/Project_Documentation/Promotional_
Material/201003_geoland2_SatChMo.pdf</gco:CharacterString>
  </gmd:otherCitationDetails>
</gmd:CI_Citation>
</gmd:citation>
<gmd:abstract>
  <gco:CharacterString>VHR land cover datasets produced by partners of FP7
Geoland2 project SATCHMO (seasonal & annual change monitoring) component
within the AFS (area frame sampling) scheme of Europe. All datasets are created
from VHR satellite imagery (KOMPSAT-2) using object-based segmentation
techniques with MMU=0.25 ha and using 10 LC classes: Urban/artificial;
Agricultural areas; Grassland; Forest/woodland/trees; Sparse woody vegetation;
Other vegetation; Water, Bare ground; Snow/ice; Cloud, voids,
etc.</gco:CharacterString>
</gmd:abstract>
<gmd:purpose>
  <gco:CharacterString>Dataset series description</gco:CharacterString>
</gmd:purpose>
<gmd:status>
  <gmd:MD_ProgressCode codeList="MD_ProgressCode"
codeListValue="onGoing">onGoing</gmd:MD_ProgressCode>
</gmd:status>
  <gmd:pointOfContact>
    <gmd:CI_ResponsibleParty>
      <gmd:individualName>
        <gco:CharacterString>Gedas Vaitkus</gco:CharacterString>
      </gmd:individualName>
      <gmd:organisationName>
        <gco:CharacterString>Aerogeodezijos institutas
UAB</gco:CharacterString>
      </gmd:organisationName>
      <gmd:contactInfo>
        <gmd:CI_Contact>
          <gmd:phone>
            <gmd:CI_Telephone>

```

```

        <gmd:voice>
            <gco:CharacterString>+370-37-755226</gco:CharacterString>
        </gmd:voice>
        <gmd:facsimile>
            <gco:CharacterString>-370-37-451497</gco:CharacterString>
        </gmd:facsimile>
    </gmd:CI_Telephone>
</gmd:phone>
    <gmd:address>
        <gmd:CI_Address>
            <gmd:deliveryPoint>
                <gco:CharacterString>Pramones pr.
13</gco:CharacterString>
            </gmd:deliveryPoint>
            <gmd:city>
                <gco:CharacterString>Kaunas</gco:CharacterString>
            </gmd:city>
            <gmd:postalCode>
                <gco:CharacterString>51327</gco:CharacterString>
            </gmd:postalCode>
            <gmd:country>
                <gco:CharacterString>Lithuania</gco:CharacterString>
            </gmd:country>
            <gmd:electronicMailAddress>
                <gco:CharacterString>gedas@agi.lt</gco:CharacterString>
            </gmd:electronicMailAddress>
        </gmd:CI_Address>
    </gmd:address>
</gmd:CI_Contact>
</gmd:contactInfo>
<gmd:role>
    <gmd:CI_RoleCode codeList="CI_RoleCode"
codeListValue="pointOfContact">pointOfContact</gmd:CI_RoleCode>
</gmd:role>
</gmd:CI_ResponsibleParty>
</gmd:pointOfContact>
<gmd:graphicOverview>
    <gmd:MD_BrowseGraphic>
        <gmd:fileName>
            <gco:CharacterString>http://www.agi.lt/SATChMo/SATChMo_VHR_LC_data
set_series_(AGI).png</gco:CharacterString>
        </gmd:fileName>
    </gmd:MD_BrowseGraphic>
</gmd:graphicOverview>
<gmd:descriptiveKeywords>
    <gmd:MD_Keywords>
        <gmd:keyword>
            <gco:CharacterString>land cover</gco:CharacterString>
        </gmd:keyword>

```

```

    <gmd:keyword>
      <gco:CharacterString>land use</gco:CharacterString>
    </gmd:keyword>
    <gmd:type>
      <gmd:MD_KeywordTypeCode codeList="MD_KeywordTypeCode"
codeListValue="theme">theme</gmd:MD_KeywordTypeCode>
    </gmd:type>
    <gmd:thesaurusName>
      <gmd:CI_Citation>
        <gmd:title>
          <gco:CharacterString>GEMET - INSPIRE themes, version
1.0</gco:CharacterString>
        </gmd:title>
        <gmd:date>
          <gmd:CI_Date>
            <gmd:date>
              <gco:Date>2009-06-30</gco:Date>
            </gmd:date>
            <gmd:dateType>
              <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Sch
emas/resources/Codelist/ML_gmx
Codelists.xml#CI_DateTypeCode"
codeListValue="publication">publication</gmd:CI_DateTypeCode>
            </gmd:dateType>
          </gmd:CI_Date>
        </gmd:date>
      </gmd:CI_Citation>
    </gmd:thesaurusName>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>
<gmd:resourceConstraints>
  <gmd:MD_LegalConstraints>
    <gmd:useLimitation>
      <gco:CharacterString>Free for non-commercial
use</gco:CharacterString>
    </gmd:useLimitation>
    <gmd:accessConstraints>
      <gmd:MD_RestrictionCode codeListValue="otherRestrictions"
codeList="MD_RestrictionCode">otherRestrictions</gmd:MD_RestrictionCode>
    </gmd:accessConstraints>
      <gmd:otherConstraints><gco:CharacterString>Free for non-commercial
use</gco:CharacterString></gmd:otherConstraints>
    </gmd:MD_LegalConstraints>
  </gmd:resourceConstraints>
<gmd:resourceConstraints>
  <gmd:MD_SecurityConstraints>
    <gmd:useLimitation>

```

```

        <gco:CharacterString>Free for non-commercial
use</gco:CharacterString>
    </gmd:useLimitation>
    <gmd:classification>
        <gmd:MD_ClassificationCode codeListValue="unclassified"
codeList="MD_ClassificationCode">unclassified</gmd:MD_ClassificationCode>
    </gmd:classification>
</gmd:MD_SecurityConstraints>
</gmd:resourceConstraints>
<gmd:spatialRepresentationType>
    <gmd:MD_SpatialRepresentationTypeCode codeListValue="grid"
codeList="MD_SpatialRepresentationTypeCode">grid</gmd:MD_SpatialRepresentationTypeCode>
</gmd:spatialRepresentationType>
<gmd:spatialRepresentationType>
    <gmd:MD_SpatialRepresentationTypeCode codeListValue="vector"
codeList="MD_SpatialRepresentationTypeCode">vector</gmd:MD_SpatialRepresentationTypeCode>
</gmd:spatialRepresentationType>
<gmd:spatialResolution>
    <gmd:MD_Resolution>
        <gmd:equivalentScale>
            <gmd:MD_RepresentativeFraction>
                <gmd:denominator>
                    <gco:Integer>10000</gco:Integer>
                </gmd:denominator>
            </gmd:MD_RepresentativeFraction>
        </gmd:equivalentScale>
    </gmd:MD_Resolution>
</gmd:spatialResolution>
<gmd:language>
    <gco:CharacterString>eng</gco:CharacterString>
</gmd:language>
<gmd:characterSet>
    <gmd:MD_CharacterSetCode codeList="MD_CharacterSetCode"
codeListValue="utf8">utf8</gmd:MD_CharacterSetCode>
</gmd:characterSet>
<gmd:topicCategory>
    <gmd:MD_TopicCategoryCode>biota</gmd:MD_TopicCategoryCode>
</gmd:topicCategory>
<gmd:topicCategory>
    <gmd:MD_TopicCategoryCode>economy</gmd:MD_TopicCategoryCode>
</gmd:topicCategory>
<gmd:topicCategory>
    <gmd:MD_TopicCategoryCode>environment</gmd:MD_TopicCategoryCode>
</gmd:topicCategory>
<gmd:topicCategory>
    <gmd:MD_TopicCategoryCode>farming</gmd:MD_TopicCategoryCode>
</gmd:topicCategory>

```

```

<gmd:extent>
  <gmd:EX_Extent>
    <gmd:geographicElement>
      <gmd:EX_GeographicBoundingBox>
        <gmd:extentTypeCode>
          <gco:Boolean>1</gco:Boolean>
        </gmd:extentTypeCode>
        <gmd:westBoundLongitude>
          <gco:Decimal>-25.0</gco:Decimal>
        </gmd:westBoundLongitude>
        <gmd:eastBoundLongitude>
          <gco:Decimal>45.0</gco:Decimal>
        </gmd:eastBoundLongitude>
        <gmd:southBoundLatitude>
          <gco:Decimal>30.0</gco:Decimal>
        </gmd:southBoundLatitude>
        <gmd:northBoundLatitude>
          <gco:Decimal>72.0</gco:Decimal>
        </gmd:northBoundLatitude>
      </gmd:EX_GeographicBoundingBox>
    </gmd:geographicElement>
  </gmd:EX_Extent>
</gmd:extent>
</gmd:MD_DataIdentification>
</gmd:identificationInfo>
<gmd:distributionInfo>
  <gmd:MD_Distribution>
    <gmd:transferOptions>
      <gmd:MD_DigitalTransferOptions>
        <gmd:onLine>
          <gmd:CI_OnlineResource>
            <gmd:linkage>
              <gmd:URL>http://www.geoland2.eu/portal/service/ShowServiceInfo.d
o?serviceId=C2809780&categoryId=B5808B80</gmd:URL>
            </gmd:linkage>
            <gmd:function>
              <gmd:CI_OnLineFunctionCode codeList="CI_OnLineFunctionCode"
codeListValue="information">information</gmd:CI_OnLineFunctionCode>
            </gmd:function>
          </gmd:CI_OnlineResource>
        </gmd:onLine>
      </gmd:MD_DigitalTransferOptions>
    </gmd:transferOptions>
  </gmd:MD_Distribution>
</gmd:distributionInfo>
<gmd:dataQualityInfo>
  <gmd:DQ_DataQuality>
    <gmd:scope>
      <gmd:DQ_Scope>

```

```

    <gmd:level>
      <gmd:MD_ScopeCode codeList="MD_ScopeCode"
codeListValue="dataset">dataset</gmd:MD_ScopeCode>
    </gmd:level>
  </gmd:DQ_Scope>
</gmd:scope>
<gmd:report>
  <gmd:DQ_CompletenessCommission>
    <gmd:result>
      <gmd:DQ_QuantitativeResult>
        <gmd:valueUnit>
          <gml:BaseUnit gml:id="ID9">
            <gml:identifier codeSpace="SI">percent</gml:identifier>
            <gml:unitsSystem />
          </gml:BaseUnit>
        </gmd:valueUnit>
        <gmd:value>
          <gco:Record>required &gt;85%</gco:Record>
        </gmd:value>
      </gmd:DQ_QuantitativeResult>
    </gmd:result>
  </gmd:DQ_CompletenessCommission>
</gmd:report>
<gmd:report>
  <gmd:DQ_DomainConsistency>
    <gmd:result>
      <gmd:DQ_ConformanceResult>
        <gmd:specification>
          <gmd:CI_Citation>
            <gmd:title>
              <gco:CharacterString>INSPIRE Implementing rules laying down
technical arrangements for the interoperability and
harmonisation.</gco:CharacterString>
            </gmd:title>
            <gmd:date>
              <gmd:CI_Date>
                <gmd:date>
                  <gco:Date>2011-05-15</gco:Date>
                </gmd:date>
                <gmd:dateType>
                  <gmd:CI_DateTypeCode codeList="CI_DateTypeCode"
codeListValue="publication">publication</gmd:CI_DateTypeCode>
                </gmd:dateType>
              </gmd:CI_Date>
            </gmd:date>
          </gmd:CI_Citation>
        </gmd:specification>
        <gmd:explanation>

```

```

        <gco:CharacterString>See the referenced
specification</gco:CharacterString>
    </gmd:explanation>
    <gmd:pass>
        <gco:Boolean>>true</gco:Boolean>
    </gmd:pass>
</gmd:DQ_ConformanceResult>
</gmd:result>
</gmd:DQ_DomainConsistency>
</gmd:report>
<gmd:lineage>
    <gmd:LI_Lineage>
        <gmd:statement>
            <gco:CharacterString>SATCHMO object-based classification tool with
manual re-coding</gco:CharacterString>
        </gmd:statement>
    </gmd:LI_Lineage>
</gmd:lineage>
</gmd:DQ_DataQuality>
</gmd:dataQualityInfo>
</gmd:MD_Metadata>
```

8 ANNEX 2 – G2_SATCHMO.SLD

This is GeoServer style document, used to visualize SATChMo vector data.

```
<?xml version="1.0" encoding="UTF-8"?>
<StyledLayerDescriptor version="1.0.0"
  xsi:schemaLocation="http://www.opengis.net/sld StyledLayerDescriptor.xsd"
  xmlns="http://www.opengis.net/sld" xmlns:ogc="http://www.opengis.net/ogc"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <NamedLayer>
    <Name> SatchMo Landcover Classes </Name>
    <!-- The 10 Core SatchMo Landcover Classes -->
    <UserStyle>

      <FeatureTypeStyle>
        <FeatureTypeName>Feature</FeatureTypeName>

        <!-- 01 Urban Artificial -->
        <Rule>
          <ogc:Filter>
            <ogc:PropertyIsEqualTo>
              <ogc:PropertyName>Class_name</ogc:PropertyName>
              <ogc:Literal>01_Urban_artificial</ogc:Literal>
            </ogc:PropertyIsEqualTo>
          </ogc:Filter>

          <PolygonSymbolizer>
            <Fill>
              <CssParameter name="fill">
                <ogc:Literal>#FF0000</ogc:Literal>
              </CssParameter>
              <CssParameter name="fill-opacity">
                <ogc:Literal>1.0</ogc:Literal>
              </CssParameter>
            </Fill>
            <!-- no border
            <Stroke>
              <CssParameter name="stroke">
                <ogc:Literal>#000000</ogc:Literal>
              </CssParameter>
            </Stroke>
            -->
          </PolygonSymbolizer>
        </Rule>

        <!-- 02 Bare Ground (soil, rock, sand dunes, dry lakes) -->
        <Rule>
```

```

<ogc:Filter>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>Class_name</ogc:PropertyName>
    <ogc:Literal>02_Bare_ground</ogc:Literal>
  </ogc:PropertyIsEqualTo>
</ogc:Filter>

<PolygonSymbolizer>
  <Fill>
    <CssParameter name="fill">
      <ogc:Literal>#FF8000</ogc:Literal>
    </CssParameter>
    <CssParameter name="fill-opacity">
      <ogc:Literal>1.0</ogc:Literal>
    </CssParameter>
  </Fill>
</PolygonSymbolizer>
</Rule>

<!-- 03 Water -->
<Rule>
  <ogc:Filter>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>Class_name</ogc:PropertyName>
      <ogc:Literal>03_Water</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:Filter>

  <PolygonSymbolizer>
    <Fill>
      <CssParameter name="fill">
        <ogc:Literal>#0000FF</ogc:Literal>
      </CssParameter>
      <CssParameter name="fill-opacity">
        <ogc:Literal>1.0</ogc:Literal>
      </CssParameter>
    </Fill>
  </PolygonSymbolizer>
</Rule>

<!-- 04 Snow and Ice -->
<Rule>
  <ogc:Filter>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>Class_name</ogc:PropertyName>
      <ogc:Literal>04_Snow_and_ice</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:Filter>

```

```
<PolygonSymbolizer>
  <Fill>
    <CssParameter name="fill">
      <ogc:Literal>#E9FFFF</ogc:Literal>
    </CssParameter>
    <CssParameter name="fill-opacity">
      <ogc:Literal>1.0</ogc:Literal>
    </CssParameter>
  </Fill>
</PolygonSymbolizer>
</Rule>

<!-- 05 Agricultural Areas -->
<Rule>
  <ogc:Filter>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>Class_name</ogc:PropertyName>
      <ogc:Literal>05_Agricultural_areas</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:Filter>

  <PolygonSymbolizer>
    <Fill>
      <CssParameter name="fill">
        <ogc:Literal>#FFFF00</ogc:Literal>
      </CssParameter>
      <CssParameter name="fill-opacity">
        <ogc:Literal>1.0</ogc:Literal>
      </CssParameter>
    </Fill>
  </PolygonSymbolizer>
</Rule>

<!-- 06 Forest Woodland Trees -->
<Rule>
  <ogc:Filter>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>Class_name</ogc:PropertyName>
      <ogc:Literal>06_Forest_woodland_trees</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:Filter>

  <PolygonSymbolizer>
    <Fill>
      <CssParameter name="fill">
        <ogc:Literal>#008000</ogc:Literal>
      </CssParameter>
      <CssParameter name="fill-opacity">
        <ogc:Literal>1.0</ogc:Literal>
      </CssParameter>
    </Fill>
  </PolygonSymbolizer>
</Rule>
```

```

        </CssParameter>
    </Fill>
</PolygonSymbolizer>
</Rule>

<!-- 07 Sparse Woody Vegetation -->
<Rule>
    <ogc:Filter>
        <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>Class_name</ogc:PropertyName>
            <ogc:Literal>07_Sparse_woody_vegetation</ogc:Literal>
        </ogc:PropertyIsEqualTo>
    </ogc:Filter>

    <PolygonSymbolizer>
        <Fill>
            <CssParameter name="fill">
                <ogc:Literal>#A3C000</ogc:Literal>
            </CssParameter>
            <CssParameter name="fill-opacity">
                <ogc:Literal>1.0</ogc:Literal>
            </CssParameter>
        </Fill>
    </PolygonSymbolizer>
</Rule>

<!-- 08 Grassland (natural grasslands) -->
<Rule>
    <ogc:Filter>
        <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>Class_name</ogc:PropertyName>
            <ogc:Literal>08_Grassland</ogc:Literal>
        </ogc:PropertyIsEqualTo>
    </ogc:Filter>

    <PolygonSymbolizer>
        <Fill>
            <CssParameter name="fill">
                <ogc:Literal>#A0FFC0</ogc:Literal>
            </CssParameter>
            <CssParameter name="fill-opacity">
                <ogc:Literal>1.0</ogc:Literal>
            </CssParameter>
        </Fill>
    </PolygonSymbolizer>
</Rule>

<!-- 09 Other Vegetation (moorland, reed beds) -->
<Rule>

```

```

<ogc:Filter>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>Class_name</ogc:PropertyName>
    <ogc:Literal>09_Other_vegetation</ogc:Literal>
  </ogc:PropertyIsEqualTo>
</ogc:Filter>

<PolygonSymbolizer>
  <Fill>
    <CssParameter name="fill">
      <ogc:Literal>#FF57C0</ogc:Literal>
    </CssParameter>
    <CssParameter name="fill-opacity">
      <ogc:Literal>1.0</ogc:Literal>
    </CssParameter>
  </Fill>
</PolygonSymbolizer>
</Rule>

<!-- 10 Cloud, voids, etc -->
<Rule>
  <ogc:Filter>
    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>Class_name</ogc:PropertyName>
      <ogc:Literal>10_Cloud_voids_etc</ogc:Literal>
    </ogc:PropertyIsEqualTo>
  </ogc:Filter>

  <PolygonSymbolizer>
    <Fill>
      <CssParameter name="fill">
        <ogc:Literal>#000000</ogc:Literal>
      </CssParameter>
      <CssParameter name="fill-opacity">
        <ogc:Literal>1.0</ogc:Literal>
      </CssParameter>
    </Fill>
  </PolygonSymbolizer>
</Rule>

</FeatureTypeStyle>
</UserStyle>
</NamedLayer>
</StyledLayerDescriptor>

```

9 ANNEX 3 – G2 SATChMO DATASET FILE NAMING CONVENTION

It is recommended to name your files according to particular project naming convention. Naming convention for G2 SATChMo classification outputs archive:

CT_ID_DATE_S_v1.zip

Table 11: Classification output archive naming convention

Element	Explanation
CT	Name of country for example PL, UK etc.
ID	ESA ID, can be found in acquisition status excel file, LUZ row. For example, 10907 for Finnish site FI_003a.
DATE	Acquisition date YYYYMMDD. For example, 20100715.
S	Sensor type, K or F
v1	Version number. For the first version, please put v1. In case product do not pass validation process and needs to be corrected, it will get v2 etc.

Inside archive, there should be following files:

Table 12: Contents of classification output archive naming convention

Element	Explanation
C _CT_ID_DATE_S_v1.tiff	classification output
T _CT_ID_DATE_S_v1.tiff	thematic raster
T _CT_ID_DATE_S_v1.csv	classes and colours of thematic raster
V _CT_ID_DATE_S_v1.shp	shapefile and all files related (.dbf .prj .shp .shx)
q1 _CT_ID_DATE_S_v1.jpg	name for quick look of site
q1_C _CT_ID_DATE_S_v1.jpg	name for quick look of classification

File naming example:

For the scene 2009-NT0-0146-EUROPE-UK005A-Ortho-BUNDLE-20090912-1-1-1 from 2009 acquisition (Batch1) the classification results files should be named as follows:

Table 13: File naming convention example

File	Explanation
UK_20090912_3970_K_v1.zip	archive
C_UK_20090912_3970_K_v1.tiff	classification output
T_UK_20090912_3970_K_v1.tiff	thematic raster
T_UK_20090912_3970_K_v1.csv	classes and colours of thematic raster
V_UK_20090912_3970_K_v1.shp	shapefile and all files related (.dbf .prj .shp .shx)
q1_UK_20090912_3970_K_v1.tiff	quick look of site
q1_C_UK_20090912_3970_K_v1.tiff	quick look of classification